Survey of Khandsari Industry in Uttar Pradesh

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REPORT

Submitted To :

Bureau of Industrial Costs and Pricing
NEW DELHI

A. Joshi

G. S. Mehta

GIRI INSTITUTE OF DEVELOPMENT STUDIES

Sector 'O' Aliganj Housing Scheme
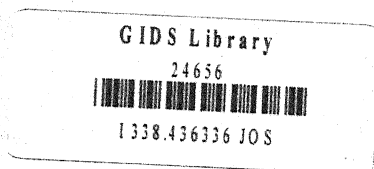LUCKNOW-226 020

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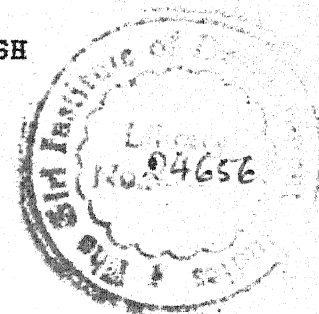GIRI INSTITUTE OF DEVELOPMENT STUDIES
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PREFACE

This study was conducted by the Giri Institute of Development Studies, Lucknow on behalf of the Bureau of Industrial Costs and Pricing, New Delhi. It aims at having some idea of the khandsari industry of Uttar Pradesh with reference to sugarcane crushed, employment, expenditure pattern and the production, sale and prices of various products especially khandsari molasses. The study is based on primary as well as secondary data. Since there is a very high concentration of khandsari units in the western region of the state, five districts were selected from the region which have a high proportion of the total units within the region. From these districts a total sample of 126 units was then selected which represent big as well as small units as well as sulphitation and non-sulphitation plants.

We wish to record our thanks to the various organisations with whose co-operation the study could be completed. First of all we wish to thank the Bureau of Industrial Costs and Pricing, New Delhi for providing the requisite funds in order to meet the cost of the study. Thanks are also due to the Cane Commissioner's Office, Lucknow and the respective Assistant Cane Commissioner's Offices of the five selected districts for their kind co-operation in providing the all important secondary information which formed the base of our study.

The timely completion of the project was made possible by some very fine team work displayed by all those associated with the study. Dr. G.S. Mehta was associated right from the stage of questionnaire formulation till the final drafting of the report. The field survey was handled by Shri B.S.Koranga, Dr. L. Dubey and Shri H.S. Tewari. They had to carry out the field work at a time when the law and order situation was far from normal. It was only through their unstinted labour that the survey could be completed efficiently and on time. The typing of the interim report was taken care of by Shri P.J.D.Kutty while Shri Manoharan K. handled the typing of the final draft in his usual quiet and efficient manner. They all deserve thanks for their efforts.

<div align="right">A. JOSHI</div>

Giri Institute of Development Studies
Lucknow

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Chapter I

INTRODUCTION

Economic development, by its very nature, is a dynamic process characterised by various types of imbalances. No where is this more striking than in the spatial dimension of growth. Growth generally tends to get concentrated in certain areas and specific regions. Regional disparities in development, particularly industrial development, is thus a serious problem experienced in all countries especially the developing ones. The disparities between regions creates imbalances in employment as well as income. India is a late starter in industrial development. Although it has achieved some success in this field, industrial growth has got concentrated in certain states and in a few selected centres. Uttar Pradesh, is among the lesser developed states. Even within the state one observes that the Western region is far more developed as compared to the remaining four regions of the state with respect to industrial development as well as agricultural development.

Industrialisation, as has been universally recognised, is a key factor in raising the levels of economic development, providing gainful employment, raising incomes and for improving the overall standard of living of the people. This is so since most of the people in developing countries generally remain engaged in agriculture. Thus their life is closely connected with the utilisation of natural resources constituting the basis of agricultural production. However, agriculture alone is incapable

of solving the developmental needs of the rural areas or the entire needs of the people. In fact, beyond a certain point even agricultural development is dependent on industrial development. Agriculture has obvious limitation in the sense that the land area is fixed and so with the rise in population any extra burden on land resources causes problems of over and under employment and land productivity begins to get adversely affected. Thus the additional man-power has got to be diverted to sectors outside agriculture beyond a certain point. Moreover, agriculture itself is dependent on the industrial sector for its growth. On the one hand agriculture, with modernisation, makes increasing use of industrial products as key inputs in the production process. This may be in the form of chemical fertilizers, pesticides and a wide range of agricultural machinery. On the other hand, it produces various products which are utilised by various industries in their own manufacturing process. A long list of such agro-based industries can be thought of in this connection. Thus agriculture and industry both play a vital role in achieving overall development of any region and a country.

There was a time when the industrial sector was heavily dependent on agricultural and other natural resources. Times have changed and the relative importance of the agricultural sector in providing inputs to the industrial sector has declined considerably with the advent of the modern manufacturing sector which utilises a wide range of intermediate products produced by the industrial sector itself as the key inputs in production. However, even today there are industries which depend on the

agricultural sector and so the significance of agro-based industries continues particularly where such a high proportion of the work-force is engaged in agriculture.

In the context of rural development it could be quite effective to utilise agricultural products through the establishment of agro-based industries and thus to achieve overall economic development. This would provide the much needed incentive to the agricultural sector and also strengthen the rural industrial development. As far as the people of the rural areas are concerned this will have far fetching results. The cultivators will find a ready market for their produce and the workforce will be able to find gainful employment if the units are located within their region. In this way the levels of living will improve. These agro-industries need not be large units. Even small scale sector industries would serve a fruitful purpose.

The agriculture based economy in most of the developing countries is passing through serious problems of providing employment to the ever increasing population. Consequently the pressure on land keeps going up since it is primarily the agricultural sector which faces the brunt of the increasing labour force for providing a source of income. The net result is that people are employed for relatively short durations and so there is disguised unemployment and this leads to problems of even maintaining the minimal standard of living of the rural masses in particular. However, owing to non-availability of opportunities of gainful employment the rural labour force has no other option

but to fall back on agriculture. In order to reduce the pressure on land and divert the labour force to sectors other than agriculture it is essential to have rural industries which can not only absorb this labour and provide income to them but also from the point of view of diversifying the base of the rural economy.

Rural industrialisation, therefore, assumes great importance as an ingredient of rural development strategy in the same way as industrialisation is of the development strategy for the country. But as there are more ways than one for approaching industrialisation of the economy, rural industrialisation too can be viewed in several ways. We could for instance treat the issue as part of the problem of location and spatial diversification of manufacturing activity, and argue that spatial concentration of industrial activities in large urban centres is not conducive to an equitable pattern of growth and, therefore, emphasis should be laid on diversification of industries into smaller towns, backward areas and villages.

The other approach to rural industrialisation which is most often adopted in India is to view it from the point of view of protecting and developing traditional village industries.

Broadly speaking we can think of three categories of rural industries. Of these two groups of industries are directly linked to agriculture. The first being those types of industries which provide inputs for agriculture by way of agricultural implements. Associated with this group are those establishments which deal with servicing and repairs of these agricultural equipments, tools

and machinery. It should be borne in mind that the scope of development of this group of industries is rather limited for the obvious reason that in any given area agricultural land is fixded and so are normally the number of peasants who create the demand for the products of this industry group.

The next group constitutes of those industries whose basic input is agricultural produce. A large list of agro-based industries automatically spring to mind to which the most prominent ones would be the sugar, vanaspati and other edibile oil industries, fruit processing units, etc. In an agricultural economy these industries have a fair potential for development since the products of these units have markets both within the rural as well as the urban areas. However, the actual level of development depends on availability of agricultural produce on the one hand and the willingness of entrepreneurs to set up their units in the rural areas on the other hand.

Finally we have the third category of rural industries which are not based on rural raw materials and resources excepting rural manpower. They generally adopt traditional technologies of production and therefore mainly cater to the needs of the rural polpulation. As a result even these industries have only a limited demand and actual demand is determined by the levels of income of the rural masses.

In the light of this it is quite obvious that the maximum potential for development of rural industries and for the overall development of rural areas as such, it is the agro-based

industries which emerge as most important. They have the potential for creating forward and backward linkages, adds value to farmer's produce and increase their net income which, in turn, motivates them for better productivity and results, develops leadership, entrepreneurship and cooperative qualities in rural society and brings about a change in culture, attitudes, orientation, etc. The enterprise becomes an anchor for effective integration of various economic services, welfare and supplementing production function. Farm-industry linkages also reinforce composite nature of national planning since development of large number of agro-industrial enterprises would generate demand for industrial plants and machinery.

Moreover, the agro-based industries have a widespread development potentials, their impact on the development of new industries in rural areas has to be sufficiently appreciated. This is with the context that if agro-industries have to be success, transportation will also have to be developed. This process will certainly further put up a demand for the creation of additional new infrastructural facilities, i.e. the development of tertiary sectors which in themselves provide more employment opportunities for the rural population. Over and above, the rural industrialisation in general and industrial development through the utilization of agricultural produced can give a structural push to the rural economy towards further development.

However, it is not possible to discuss a number of such agro-based industries together. The present study, therefore, aims at focussing attention on one such industry namely khandsari

industry, which utilises agricultural produce and can easily be set up even in rural areas. Thereby contributing towards rural industrial development, employment and income generation and also provide adequate incentives to the cultivation.

Sugarcane, as we are well aware, is an important cash crop of the state and is extensively grown in the Western Central and Eastern regions of Uttar Pradesh. It, therefore, plays a significant role in the agricultural economy of the state. Major concentration, however, is found in the Western region. There has been an increasing trend in the productivity of sugarcane over the years and so the level of production too has been on the increase except for a few years during which there have been fluctuations in both yield and production.

The sugar industry of the state is a very old one. Even before sugar began being manufactured in the big modern mills using the vacuum pan process, white sugar was being manufactured through a traditional process.

From times immemorial white sugar has been manufactured in India by a process known by the name of Khandsari. To begin with this process produced powdery sugar of yellowish colour through a slow, laborious and inefficient process in which the recovery was very poor. While this process remained practically static in India, the sugar industry developed considerably elsewhere into an efficient process called vacuum pan. The sugar manufactured through the vacuum pan process was not only white and crystalline but even the recovery was much higher than Khandsari.

As the demand for white sugar went up particularly after the First World War, the import bill started proving a big drain on the Indian economy. The government was, therefore, forced to encourage the vacuum pan industry by passing a Sugar Industry (Protection) Act, in 1932, under which an import duty on sugar was imposed. Besides this the government also instituted a research scheme for improving the efficiency of the Khandsari industry. As a result of the grant of protection to the sugar industry a phenomenal rise took place in the number of industries as well as in the area under sugarcane cultivation.

Between 1936 and 1948, the Gur and Khandsari Scheme of Bilari was instrumental in developing a new process known as the "Open Pan Sulphitation Process". This process not only improved the sugar recovery but also the quality of Khandsari sugar. However, even today not all the Khandsari units are sulphitation units and so their recovery is lower as compared to the sulphitation units. Even the sulphitation units are unable to produce either the same quality of sugar or achieve the recovery levels as obtained by the modern sugar mills which work on the vacuum pan process.

A look into the time-series data of the Gur and Khandsari units located in Uttar Pradesh clearly reveals that between 1975-76 and 1989-90 there has been a distinct declining trend in the total number of units in the state. This is so particularly since 1980-81. The reasons for this are various. To begin with while the modern sugar mills were encouraged there has been a clear-cut policy to discourage the Khandsari industry. This is evident from

the fact that for nearly two decades no license is being issued
for the establishment of new units except in some exceptional
cases. A second cause for the declining trend is the stiff
competition which the Khandsari industry is facing from the modern
sugar mills, whose number has gone up steadily from 77 in 1975-76
to 104 in 1989-90. The government has fixed a reserved area for
the sugar mills and so they are assured of their supply. There is
no such reserved area as far as the Khandsari units are concerned.
On the contrary, the Khandsari units have to pay a purchase tax on
the sugarcane purchased by them. The rate of purchase tax has
been increased over the years and is currently fixed at Rs.1.50
per quintal. The Khandsari units are also faced with labour
problems, power problem and the problem of undue interference in
their work from a number of government departments to whom they
are either directly or indirectly accountable.

To add to the problems of the Khandsari units, the government
in 1977 allowed the setting up of the "Khara Kolhu" without the
formality of any registration on licensing. While in a Khandsari
unit the crusher is placed horizontally, the crusher is placed
vertically in the case of a 'Khara Kolhu'. Consequently the
crushing capacity of the 'Khara Kolhu' is relatively lower.
Whereas on paper a 'Khara Kolhu' is supported to be installed by
only such farmers who produce their own cane, in actual practice
this restriction is being openly flouted since the 'Khara Kolhu'
units do not come under the supervision of any authority. These
'Khara Kolhu' units exist in large number in many districts and
are competing for the purchase of sugarcane.

Out of the total sugarcane produced around 15-17 per cent is set aside for seed, personal consumption and is wasted on the farms. Another 33 per cent is reserved for the modern sugar mills. Thus around 50 per cent is left for the Khandsari and Khara Kolhu units or for other uses.

However, it is quite interesting to note that despite the fact that the total number of Khandsari units have shown a declining trend, the total quantum of sugarcane crushed has increased over the years. Between 1975-76 and 1989-90 the number of units were reduced to less than half yet the total quantity of sugarcane crushed more than doubled. This is possibly so because despite the problems of the Khandsari sector, those who have survived are the more efficient units. They have increased their crushing capacity by increasing the total daily crushing time and by increasing the size and number of crushers. However, since 1986-87 there has been a declining trend in total sugarcane crushed and this has also affected the production of Khandsari and other products (Table 1.1).

Although the Khandsari industry of the state has been a fairly important one not only in terms of total numbers but also from the point of view of employment (the total employment provided by them in 1985-86 was 80124 according to the Annual Survey of Industries, U.P.), yet not much work has been done in the state. It was, therefore, thought that it would be worthwhile to study the Khandsari sector of Uttar Pradesh in order to analyse aspects such as existing crushing capacity and the corresponding

efficiency in terms of recovery. The Giri Institute of Development Studies, Lucknow, then took up the present study sponsored by the Bureau of Industrial Costs and Pricing, New Delhi, with the following broad objectives.

(a) To study the existing crushing capacities of different units and the actual quantity of sugarcane crushed by them;

(b) To assess the degree of competition that exists between the modern sugar factories and Khandsari units in the procurement of sugarcane for crushing and the respective prices paid by both types of units for the sugarcane purchased;

(c) To try and assess the total quanity of sugar produced by the Khandsari sector and work-out the recovery rates of these units so as to make a comparative assessment of recovery vis-a-vis modern sugar mills;

(d) To try and assess the quantity of Khandsari molasses produced by these units; and

(e) To try and find out the prices at which Khandsari molasses are sold along with different categories of purchasers of Khandsari molasses.

Data Base

The Cane Commissioner's Office provides data such as total number of units, actual cane crushed and production of different products. Some secondary information is also available in the Annual Survey of Industries, U.P. But not all the information desired is available. So the report is based on secondary as well as primary data. Primary data was obtained by carrying out a field survey.

District and Sample Selection

The Khandsari units are very heavily concentrated in Western Region of the state and the units located in this region account for 86.8 per cent of the total units located in the state as a

whole. Even in the western region 5 districts namely, Moradabad, Bijnor, Muzaffarnagar, Meerut and Saharanpur taken together account for 58.4 per cent of the total units and around 69.5 per cent of the sugarcane crushed by the Khandsari units of Uttar Pradesh. It was, therefore, decided to survey these five districts for the purpose of the study.

Although, during the year 1989-90 the total number of Khandsari units were 1552, not all of them were registered under the Factories Act since many are very small units producing only gur on a small scale. It was, therefore, decided to survey only the relatively larger unit registered under the Factories Act. The information regarding the units Registered under the Factories Act is provided by the Annual Survey of Industries published by the Economics and Statistics Division of the State Planning Institute, Government of U.P. The ASI was available for the year 1985-86 and this has reported a total of 968 units. Moreover, even the licensed united during 1990-91, as provided by the Cane Commissioner Office, is 1424. Out of these 314 are not working during the current crushing season. Thus the actual number of working units is only 1110. Thus our total sample of 126 units, therefore, covers over 10 per cent of the khandsari units and is, therefore, a representative sample. While keeping the overall sample size of around 10 per cent care has also been taken to select units so as to incorporate khandsari units of different crushing capacities and also cover both sulphitation and non-sulphitation units.

Initially it was decided that we would cover around the same number of units from each district. However, it was revealed that

for the crushing season 1990-91 even fewer number of units have applied for the renewal of licences, so it was not possible to keep the size of the sample equal for all districts. The study has, therefore, kept the total size of the sample unaltered but was forced into having different number of units surveyed in each district.

Sugarcane Economy of Uttar Pradesh

Sugarcane, an important cash crop of the state, is grown extensively in the Western, Central and Eastern regions of the state and plays a significant role in the agricultural economy of the state. In the year 1988-89 the total area under sugarcane was 14.64 lakh hectares in the state as a whole. Of this the five districts selected by us together accounted for nearly 44 per cent of the area covered under sugarcane and their share in total production of sugarcane was around 49 per cent. This primarily answers the question as to why there is such a heavy concentration of Khandsari units in these five districts. Even in terms of yield rates these districts have a much higher yield rate as compared to the state as a whole. The 1989-90 figures show an average yield of 553.44 qts/hect. for the state while in our selected districts it ranges from a low of 571.68 qts/hect. in Moradabad to a high of 621.48 qts/hect. in Muzaffarnagar.

The sugarcane cultivation in the state, seen in terms of total area under sugarcane, depicts a fluctuating trend. In the year 1974-75 the total area under sugarcane was 14.91 lakh hectares which worked out to be 8.68 per cent of the net area sown

in the state. The year 1980-81 witnessed the least area under sugarcane cultivation (13.63 lakh hectares) and was only 7.91 per cent of the net area sown. The highest figure of 18.00 lakh hectares was achieved during the year 1987-88 and this was 10.50 per cent of the net area sown (Table 1.2). While the figures of area show fluctuations over the years the figures relating to average yield by and large show an increasing trend except for a couple of years in between. Thus the yield in quintals per hectare went up considerably from 412.19 in 1974-75 to 553.44 by the year 1989-90.

Looking at the selected districts we find that they too experience a fluctuating trend as far as the area under sugarcane is concerned. In the case of Moradabad the area under sugarcane was 19 per cent of the net area sown in that district during 1974-75. By the year 1987-88 this percentage had increased considerably to 29.30 per cent. Similarly the yield rates per hectare had gone up significantly from 437.17 qts/hect. to 571.68 qts/hect. during 1974-75 to 1989-90 (Table 1.3).

The area under sugarcane as a percentage of net area sown was as high as 31.51 per cent in 1974-75 and went up to almost 49 per cent by 1987-88 in Bijnor. This is one of our selected districts which has experienced minimum fluctuation in its area under sugarcane between 1974-75 and 1989-90. However, the district has had considerable fluctuations in the yield rates of sugarcane over the same period of time (Table 1.4).

The other district with minimum fluctuation in area under

sugarcane is Muzaffarnagar which is the most important sugarcane growing district in the state and has the largest area under sugarcane. In 1974-75 the area under sugarcane accounted for 47.63 per cent of the net area sown. By 1987-88 this percentage stood at 58.18. Just like Bijnor even Muazaffarnagar has also experienced fluctuations in its yield rates (Table 1.5).

In the case of Meerut we observe that both its net area sown as well as area under sugarcane have gone down in 1987-88 as compared to 1974-75. The reason for this is that around 1975 Ghaziabad, which was a part of Meerut district, got an independent status of a district and for this a part of Meerut district besides Ghaziabad were taken away from it. In 1974-75 its area under sugarcane was 37.63 per cent of the net sown area. By 1987-88 this percentage had increased to 51.29. The average yield in the year 1989-90 was 615.28 qts/hect. was second only to Muzaffarnagar (Table 1.6).

Finally, when we look at Saharanpur it is found that there are not only year to year fluctuations in area under sugarcane but that in 1989-90 the total area under sugarcane has gone down below the figure obtained in 1974-75. This too is on account of the fact that Haridwar has emerged as an independent district although it was earlier a part of Saharanpur. In 1974-75 30.00 per cent of the net sown area was under sugarcane. By 1987-88 this percentage raised to around 39. At the same time the yield rates have increased to 591.28 qts/hect. in 1989-90 as compared to 451.00 qts/hect. in 1974-75. However, there have been marked fluctuations in between (Table 1.7).

The main varieties of sugarcane grown in our sample districts are BO-70, BO-54, BO-38, BO-58, BO-67 and BO-48. Although these different varieties of sugarcane have been considered suitable for the purpose of manufacturing sugar and gur etc. but the BO-48 variety is considered to be much more superior variety of crop since it contains a higher quantity of juice and so facilitates a higher juice recovery as compared to the other varieties mentioned above. There is, however, no difference in the prices of different varieties so obviously the manufacturers of Khandsari prefer BO-48 variety to any other variety. Unfortunately, despite its greater demand it is not grown over a larger area because it needs special kind of soil and higher irrigation facilities. As a result even in areas where it can be grown its cost of cultivation is slightly higher as compared to other varieties. The cultivators, therefore, are growing other varieties of sugarcane which can be grown with relative ease and at lower cost. The other factor is that the yield rates of BO-48 are lower as well so this variety is doubly unprofitable to the cultivator. Yet another disadvantage of BO-48 is that it is less resistant to bad weather and being thinner it can be easily eaten up and damaged by animals.

Table 1.1 : Data Relating to Khandsari Units of Uttar
Pradesh

Year	Licensed Units	Working Units	Cane Crushed (lakh qtl.)	Khandsari Produced (lakh qtl.)	Gur Produced (lakh qtl.)	Molasses Produced (lakh qtl)	Price of Cane per qtl. (Rs.)	
							Minimum	Maximum
1975-76	4077	3500	550.20	23.06	7.51	13.60	8.00	18.00
1980-81	2875	2636	805.62	33.09	8.15	12.78	10.00	22.00
1981-82	2813	2501	901.48	45.25	15.53	N.A.	10.00	22.00
1982-83	2761	2184	972.72	48.01	11.39	4.35	8.00	25.00
1983-84	2374	2041	909.97	39.42	14.60	6.54	8.00	21.00
1984-85	2077	1808	828.81	39.00	10.04	6.16	10.00	30.00
1985-86	1940	1744	1021.27	48.09	23.48	4.08	13.00	33.00
1986-87	1874	1767	1283.24	66.35	15.56	2.23	10.00	33.00
1987-88	1815	1666	1254.54	53.05	19.01	6.65	10.00	27.00
1988-89	1744	1600	1199.33	51.04	20.30	0.69	15.00	40.00
1989-90	1641	1552	1119.93	51.14	20.65	4.36	18.00	50.00

Source : Cane Commissioner's Office, Lucknow

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Table 1.2 : Area and Production Sugarcane in U.P.

Year	Net area sown (lakh ha)	Net irri- gated (lakh ha)	Total area under sugarcane (lakh ha)	Total irri- gated area under sugar- cane (lakh ha)	Production of sugar- cane (lakh qtl)	Average yield (qtl/ha)
1974-75	171.60	77.93	14.91	10.67	6147.92	412.19
1975-76	172.01	79.33	14.40	10.36	5835.90	405.08
1976-77	173.75	82.60	14.55	11.00	6521.55	447.94
1977-78	174.21	84.93	16.36	12.67	7681.86	469.41
1978-79	174.81	88.92	16.33	12.36	6232.42	381.46
1979-80	169.97	89.12	13.72	10.41	5122.84	373.17
1980-81	172.21	94.53	13.63	10.88	6420.49	470.90
1981-82	172.88	95.41	16.51	13.46	7644.01	462.79
1982-83	172.26	98.84	17.82	13.92	8138.67	456.55
1983-84	172.73	98.79	13.88	13.15	7824.38	463.54
1984-85	172.48	101.54	15.43	12.31	7088.82	459.36
1985-86	172.43	101.32	14.89	12.11	7303.68	490.19
1986-87	172.32	98.54	16.80	13.84	8473.63	505.09
1987-88	171.35	100.43	18.00	14.88	9305.40	516.68
1988-89	NA	NA	17.61	14.64	8852.27	502.60
1989-90	NA	NA	17.55	NA	9712.77	553.44

Source : Directorate of Agriculture, U.P., Lucknow
         Same source for Tables 1.3 to 1.7.

Table 1.3 : Area and Production Sugarcane in District
Moradabad

Year	Net area sown (lakh ha)	Net irri-gated (lakh ha)	Total area under sugarcane (lakh ha)	Total irri-gated area under sugar-cane (lakh ha)	Production of sugar-cane (lakh qtl)	Average yield (qtl/ha)
1974–75	4.63	2.67	0.88	0.74	383.60	437.17
1975–76	4.59	2.75	0.89	0.73	387.45	434.84
1976–77	4.76	2.98	0.94	0.83	440.27	467.00
1977–78	4.78	2.87	1.03	0.90	488.76	473.02
1978–79	4.72	3.09	1.13	0.96	424.74	376.96
1979–80	4.73	3.25	0.95	0.83	366.81	386.67
1980–81	4.79	3.41	1.03	0.95	567.20	549.12
1981–82	4.82	3.58	1.32	1.23	603.54	456.76
1982–83	4.84	3.74	1.43	1.30	721.27	505.52
1983–84	4.84	3.84	1.38	1.25	606.71	440.56
1984–85	4.84	3.78	1.22	1.13	593.85	487.52
1985–86	4.82	3.89	1.17	1.10	597.49	511.88
1986–87	4.87	2.94	1.35	1.30	663.91	493.56
1987–88	4.88	3.09	1.43	1.39	758.78	529.88
1988–89	NA	NA	1.33	1.29	675.25	506.32
1989–90	NA	NA	1.24	NA	706.48	571.68

Table 1.4 : Area and Production Sugarcane in District Bijnor

Year	Net area sown (lakh ha)	Net irrigated (lakh ha)	Total area under sugarcane (lakh ha)	Total irrigated area under sugarcane (lakh ha)	Production of sugarcane (lakh qtl)	Average yield (qtl/ha)
1974-75	3.11	1.34	0.98	0.65	502.49	512.46
1975-76	3.16	1.42	0.68	0.67	444.67	455.59
1976-77	3.38	1.62	1.04	0.79	473.61	454.71
1977-78	3.44	1.67	1.30	1.00	711.28	544.92
1978-79	3.48	1.80	135	1.00	570.73	423.45
1979-80	3.44	1.92	1.19	0.92	467.50	391.62
1980-81	3.45	1.98	1.25	1.02	626.21	501.97
1981-82	3.45	1.96	1.24	0.99	539.32	435.44
1982-83	3.46	2.06	1.50	1.20	758.30	505.88
1983-84	3.48	2.03	1.48	1.16	728.23	491.76
1984-85	3.44	2.14	1.41	1.09	671.40	475.84
1985-86	3.43	2.16	1.36	1.13	741.64	545.16
1986-87	3.42	2.22	1.52	1.27	792.98	521.28
1987-88	3.39	2.36	1.66	1.40	882.30	531.72
1988=89	NA	NA	1.60	1.38	858.36	533.60
1989-90	NA	NA	1.73	NA	1002.45	578.12

Table 1.5 : Area and Production Sugarcane in District
Muzaffarnagar

Year	Net area sown (lakh ha)	Net irri- gated (lakh ha)	Total area under sugarcane (lakh ha)	Total irri- gated area under sugar- cane (lakh ha)	Production of sugar- cane (lakh qtl)	Average yield (qtl/ha)
1974-75	3.23	2..64	1.53	1.40	705.61	460.11
1975-76	3.24	2.62	1.54	1.40	752.52	489.78
1976-77	3.29	2.72	1.61	1.50	890.33	551.76
1977-78	3.31	2.78	1.78	1.65	938.14	525.91
1978-79	3.34	2.81	1.68	1.54	702.04	418.53
1979-80	3.31	2.85	1.58	1.47	720.85	457.02
1980-81	3.33	2.84	1.63	1.53	877.13	538.44
1981-82	3.32	2.84	1.78	1.66	924.88	520.36
1982-83	3.31	2.89	1.81	1.69	981.31	453.56
1983-84	3.31	2.90	1.79	1.68	1076.35	602.48
1984-85	3.35	2.95	1.87	1.78	1076.44	574.36
1985-86	3.39	2.96	1.70	1.62	966.79	568.76
1986-87	3.34	2.99	1.86	1.78	1061.45	569.36
1987-88	3.30	3.01	1.92	1.83	1109.85	579.12
1988-89	NA	NA	1.91	1.83	1119.96	586.12
1989-90	NA	NA	.85	NA	1147.26	621.48

Table 1.6 : Area and Production Sugarcane in District Meerut

Year	Net area sown (lakh ha)	Net irrigated (lakh ha)	Total area under sugarcane (lakh ha)	Total irrigated area under sugarcane (lakh ha)	Production of sugarcane (lakh qtl)	Average yield (qtl/ha)
1974-75	4.57	3.98	1.72	1.63	757.90	440.54
1975-76	4.59	3.93	1.68	1.59	813.47	484.74
1976-77	3.09	2.75	1.41	1.36	665.08	470.95
1977-78	3.11	2.78	1.56	1.50	855.94	548.69
1978-79	3.14	2.82	1.49	1.43	683.08	459.87
1979-80	3.10	2.86	1.36	1.31	629.80	463.18
1980-81	3.11	2.89	1.45	1.41	784.11	541.42
1981-82	3.12	2.91	1.63	1.59	768.81	473.00
1982-83	3.14	2.93	1.62	1.57	815.57	504.88
1983-84	3.14	2.95	1.59	1.55	831.20	523.96
1984-85	3.13	2.98	1.51	1.48	805.44	534.08
1985-86	3.13	3.00	1.50	1.48	717.95	477.60
1986-87	3.12	2.61	1.55	1.53	817.35	527.60
1987-88	3.10	3.04	1.59	1.57	835.51	525.36
1988-89	NA	NA	1.60	1.59	825.81	516.48
1989-90	NA	NA	1.61	NA	989.46	615.28

Table 1.7 : Area and Production Sugarcane in District Saharanpur

Year	Net area sown (lakh ha)	Net irri- gated (lakh ha)	Total area under sugarcane (lakh ha)	Total irri- gated area under sugar- cane (lakh ha)	Production of sugar- cane (lakh qtl)	Average yield (qtl/ha)
1974-75	3.70	2.18	1.11	0.82	502.01	451.06
1975-76	3.71	2.20	1.11	0.85	541.10	487.58
1976-77	3.79	2.32	1.09	0.87	565.52	517.75
1977-78	3.80	2.41	1.26	1.02	701.22	554.56
1978-79	3.82	2.48	1.19	0.93	448.74	375.99
1979-80	3.78	2.60	0.98	0.79	424.54	432.16
1980-81	3.82	2.58	1.09	0.93	572.78	525.28
1981-82	3.83	2.77	1.36	1.16	669.39	493.48
1982-83	3.82	2.72	1.43	1.22	714.02	499.00
1983-84	3.81	2.77	1.39	1.18	723.79	519.68
1984-85	3.81	2.80	1.28	1.11	614.48	479.40
1985-86	3.83	2.84	1.26	1.12	650.43	518.20
1986-87	3.84	2.90	1.37	1.24	761.05	554.28
1987-88	3.79	2.60	1.48	1.34	892.91	605.00
1988-89	NA	NA	1.52	1.40	845.46	554.60
1989-90	NA	NA	1.07	NA	629.96	591.28

Chapter II

SUGARCANE PROCESSING IN UTTAR PRADESH

Sugarcane, which is widely grown all over the state in general and particularly in the Western and Eastern regions, is mainly utilised by three types of units for conversion into sugar and other products. Since the Western region dominates the state with respect to sugarcane production it is quite obvious that there is also a heavy concentration of these units in the region because they offer a distinct locational advantage.

Sugar Industry

The first and the most important category of units are the large sugar mills which manufacture white crystalline sugar with the help of the vacuum pan process. These units are found both in the public and the private sector. The public sector units are mainly those which had been taken over by the government on becoming sick units. Besides these, there are also some units which were established as public sector units. In order to ensure adequate suply of sugarcane to the large mills the government has reserved an area of 16 kilometers around the sugar mill from which they are to purchase their sugarcane. No other sugar mill can encroach into the reserve area of any particular unit. Within each reserve area there is a cooperative society and all the growers who wish to sell their sugarcane to the mill have to be registered members of this society. The sugar mill then gives its day to day requirement details to the society which in turn

selects the cultivators who are to supply the cane to the sugar mill. In this manner it tries to ensure that all the cultivators get their turn in rotation and without any inconvenience either to the cultivators or the sugar mills. The government also fixes a minimum cane procurement price every year to safeguard the interest of the cultivators. The payment for cane supplied is made to the cultivators through the cooperative society and for this service the cooperative society charges them around two per cent by way of service charges.

The sugar units of the state have grown gradually over the years. According to the Annual Surey of Industries (ASI) the state as a whole had 81 registered but only 78 units filled in their ASI returns. Thus we are providing data pertaining to only those units from which returns were received. The data are being given for four points of time. Between 1976-77 and 1985-86 (the last year for which the ASI report is available) the number of units in the state filing their returns rose from 78 to 91. Correspondingly their fixed capital registered an almost four fold increase from around 5000 lakh rupees to around 19300 lakh rupees. Similarly there was also an appreciable increase in the value of working capital. In terms of employment, however, it is observed that total employment has gone down to less than half in absolute numbers. Since the total number of units has gone up we find a corresponding increase in both total value of inputs as well as total value of output. The value added per worker has experienced a very high increase from a mere Rs.4858 in 1976-77 to Rs.35426 in the year 1985-86.

In the case of Bijnor we observe that, except during the year 1979-80 when there were 7 units, there were 4 units for the remaining three points of time. However, the value of fixed capital went up nearly ten times between 1976-77 and 1985-86. On the other hand, there has not been much of a variation with respect to value of working capital except during 1982-83 when it suddenly dropped to a very low figure. Total employment, as could be expected, was higher for the year when there were 7 units otherwise employment too has fluctuated only between 3 to 4.8 thousand. It is interesting to find that during 1985-86 employment levels at the all U.P. level as well as in the case of individual districts has gone down. This could be because of the modernisation of plant and machinery which is less labour intensive. While there was no change in the total units, total production went up quite considerably from around 1868 lakhs to nearly 6093 lakh rupees. Consequently, value added per worker has also witnessed a very sharp rise.

For the first three points of time the units in Muzaffarnagar remained unchanged but one more unit was added in 1985-86 taking total number of units to 5. Both fixed and working capital went up considerably and this investment is also reflected in the higher levels of production. We, therefore, find that there has been an appreciable increase in the value added per worker.

Between 1976-77 and 1979-80 total units of Meerut remained 5. They increased to 7 in 1982-83 but then there were only 4 in 1985-86. But despite this decline, value of fixed capital went up from

Rs.447.85 lakhs during 1976-77 to Rs.1727.52 lakhs by 1985-86. Once again the employment pattern remained unchanged with employment level going down to less than half in 1985-86 as compared to 1976-77. The value of total output was highest during 1982-83 when there were 7 units. Even then the total output of 1985-86 was much higher as compared to 1976-77. Lower level of employment and a higher level of production pushed up the figure of value added per worker quite high during the year 1985-86.

Even in the case of Saharanpur there was not much change in the total number of units over the period in question. Strangely enough 1982-83 was a bad year for the sugar industry in Saharanpur. The value of total production was Rs.4589.42 lakhs whereas total inputs were to the tune of Rs.4860.07 lakhs. Thus we have a negative figure of value added. On the contrary, 1985-86 witnessed a record output of Rs.8043.29 lakhs and value added per worker was a phenomenal figure of around Rs.95670.

On the whole we observe that while the total number of sugar factories have not risen very appreciably either within the state as a whole or among our selected districts. There has been a considerable increase in the values of fixed capital, total output and value added per worker (Table 2.1).

It has already been discussed that the government fixes the procurement prices of sugarcane to protect the interest of the cane growers. While the central government announces a price, the state government also announces its prices for the state and these are always slightly higher than those announced by the central

government.   The sugarcane procurement prices have been going up
steadily.   In 1976-77 the procurement prices announced by the
central government were Rs.10.80 per quintal (maximum price) as
against which the maximum price offered by the state government
was Rs.13.25 per quintal.   By 1989-90 these had gone up to Rs.29
per quintal in the case of the central government whereas the
corresponding price announced by the state government was Rs.38
per quintal (Table 2.2).

The   sugar recovery of the large sugar mills of the state is
around 9.5 per cent (1989-90).   There are, however, some
variations over the years.   Variations within the same year may be
found between individual units depending on the state of plant and
machinery and managerial efficiency.   Thus there may be units
where the recovery rate may be upto 10.5 per cent.

The recovery rate of sugar molasses is around 4.46 per cent
(1989-90).   Here too we find variations over the years.   The
molasses recovery is inversely related to the sugar recovery. For
instance during 1987-88 the average sugar recovery of the state
was only 8.9 per cent but molasses recovery was 5.00 per cent.

The sugar recovery rate of the selected districts ranged
between 8.40 per cent in Moradabad to 12.31 per cent in Meerut.
Similarly, the recovery percentage of molasses varied from 4.46 in
Saharanpur to 6.41 per cent in Meerut. Thus we find that the
sugar mills of Meerut seem to be working on a very high level of
efficiency.

Khandsari and Gur Industry

In the introductory chapter we have already indicated that the Khandsari industry is very old and traditional one and that the efficiency of these units is much lower as compared to the sugar mills.

The Khandsari process was improved between 1936-1948 and the 'open pan sulphitation' process was introduced. The Khandsari units come under the small scale industries and a large number of them are also registered under the Factories Act. The government has not been very favourable to them because over the last two decades there has been a policy of not granting new licenses for these units except for in exceptional circumstances such as a bumper sugarcane crop during a particular year. Each Khandsari unit has to renew its license on a year to year basis. They have to pay a fixed license fee depending on the size of the crusher being used by them. The current rates for the license fee is :

i)   10 inch x 12 inch crusher   Rs.650/-

ii) 11 inch x 14 inch crusher   Rs.725/-

iii) 13 inch x 18 inch crusher   Rs.825/-

Each crusher has a fixed crushing capacity which increases with the size of the crusher. Thus the smallest crusher has an average crushing capacity of around 4 tonnes per hour while the two bigger size crushers have a crushing capacity of around 6 and 10 tonnes per hour respectively.

A Khandsari unit having a crusher size of 11 inch x 14 inch costs around Rs.14.00 lakhs approximately at present. This is

inclusive of all the various machinery and other equipment needed
to set up a sulphitation unit.

Khandsari is manufactured through two main processes. The
traditional or non-sulphitation method and the open pan
sulphitation method. The non-sulphitation units have a single
process. If you start by crushing say one quintal of sugarcane
around 60 kgs. of sugarcane juice is obtained. This gets
converted into around 11 kgs of Raab from which 5 kgs. of
Khandsari and 6 kgs of Khandsari molasses are obtained.

In the open pan sulphitation unit, on the other hand, the
production is a three stage process. Starting with one quintal
of sugarcane 5 kgs. of Khandsari is obtained after the first
process. The molasses left over is recycled and at the end of the
second process another 1.5 kgs of Khandsari is recovered. And
after the third stage of production yet another 0.5 kgs. of
Khandsari is obtained while around 4 kgs. of molasses is left
over. In all therefore 7 kgs. of Khandsari is recovered from each
quintal of sugarcane along with 4 kgs of Khandsari molasses.

Despite the fact that the recovery rates are higher in a
sulphitation unit, less than half (627) of the total units (1552)
were sulphitation units during 1989-90. This is primarily so
because the cost structure of a sulphitation unit does not suit
all the Khandsari manufacturers and because the total units also
consist of those who are making only gur. For gur manufacture
the traditional form of production is sufficient.

The crushing season, as shown in the records of the Cane Commissioner's Office, starts from the first of September and ends on the last day of June. However, in actual practice crushing generally begins around October and does not go beyond May in any case. In fact many a times crushing may be over earlier as well depending on the availability or non-availability of sugarcane. In the case of sulphitation units the crushing is delayed as compared to the non-sulphitation units because in the initial stages sugarcane contains water and this is allowed to dry up to a certain extent before crushing begins.

The Khandsari units neither have any reserved cane area for them nor does the government fix any procurement price in their case. On the other hand, they have to pay a purchase tax on the sugarcane purchased by them. The current rate of purchase tax is Rs.1.50 per quintal.

Since around 33 per cent of the sugarcane is utilised by the sugar mills and around 17 per cent is kept aside for seed and on farm consumption there is still another 50 per cent sugarcane left over out of the total production. And as the western region has a high sugarcane production the Khandsari units never really face the problem regarding availability of sugarcane. They purchase their sugarcane requirement directly from the cultivators. Since all the units are old units they have developed personal relationship with a number of cultivators and so their day to day requirement arrives at the Khandsari unit itself. As far as prices of sugarcane is concerned, the prices are certainly affected by the on-going procurement prices. But it is

generally observed that in the intial stages the prices at which
Khandsari units are able to procure sugarcane are much lower
because of a variety of reasons. Firstly, the sugarcane has a
higher water content. Secondly, the cultivators are desirous of
disposing of their produce so that they can have ready cash on one
hand and a free farm on the other for the cultivation of Rabi
crops. Thirdly, not all the cultivators are members of the
cooperative which sells cane to the sugar mills. However, from
November onwards sugarcane prices start increasing and by the time
the crushing season ends the Khandsari manufacturers might even be
paying prices much higher than the procurement prices fixed by the
government.

As far as the different products are concerned, the units
manufacture Khandsari, pure gur, Raab for sale as Raab itself,
molasses and 'badda gur'. 'Badda gur' is nothing else but
solidified molasses in the shape of pure gur. It is dark brown.
While Khandsari and pure gur are used directly for consumption,
Raab, molasses and 'bada gur' may be used either directly for
consumption or as an intermediate product in the manufacture of
tobacco and alcohol. In fact, bulk of the molasses and 'badda
gur' produced goes into the production of alcohol.

Looking at the data provided by the Annual Survey of
Industries, the state as a whole had a total of 740 registered
factories which provided their details for the ASI, their number
went up in 1979-80 (790 units) as well as in 1982-83 (1152 units)
but came down in 1985-86 (968 units). This conforms to the

overall assessment that their numbers have been declining over the years. The initial increases are because some of the units which earlier were not registered under the Factories Act came under the purview of the Act at time went by.

During 1976-77 the value of fixed capital was around Rs.1243 lakhs but by 1985-86 it had more than doubled to Rs.2734 lakhs. Similarly there was an even greater increase with respect to working capital. Unlike the sugar industry where we observed a declining tendency in total employment total employment between 1976-77 and 1985-86 has registered an increase which probably indicates the fact that there has been no modernisation of these units and that they continue to be traditional and labour intensive (Table 2.4).

The total output of this sector has risen sharply between 1976-77 and 1985-86. The increase registered has been around 193 per cent. However, since the sector is traditional and relatively inefficient using labour intensive technology the value added per worker has hardly shown any increase. It increased from Rs.2074 in 1976-77 to 3551 in 1985-86, an increase of only 71.22 per cent whereas the corresponding increase in the case of the sugar industry was well over 625 per cent.

Among the five districts selected for the present study Bijnor had the highest number of registered Khandsari units (221 units) in 1976-77. By 1985-86 this number had gone down to 208. However, fixed capital, working capital, total employment all went up by 1985-86 as compared to 1976-77. So also did the total

output witness a more than two-fold increase. Value added,
although registering an increase, did not go up in the same
proportion. The increase being only around 56 per cent (Table
2.4).

As far as factories registered under the factories act is
concerned, Meerut ranks last among the five districts in terms of
numbers. It had only 37 units in 1976-77 and in 1985-86 this
number had gone up to 86. However, the district ranks first as
far as value added per worker is concerned. Even in 1976-77 the
value added per worker was Rs.3556, a figure surpassed only by
Moradabad and that too in 1985-86. By 1985-86 the corresponding
figure for Meerut was Rs.5096. But this increase in percentage
terms, between 1976-77 and 1985-86, of around 43 per cent, is
lower than that of Bijnor, Muzaffarnagar as well as Saharanpur.

Moradabad is the only district where the number of Khandsari
units has shown a gradual increase at all the four points of time.
In fact the increase is over three fold. Accordingly, even the
value of total output went up by over three fold. However, the
value added per worker went up by only around 22 per cent.

Muzaffarnagar is the other district besides Bijnor with a
high number of Khandsari units. It ranked first in 1985-86 with
respect to value of total production. Total production was valued
at Rs.4913.67 lakhs which works out to 23.5 per cent of the total
value of output for the state as a whole. Here too value added
per worker showed an increase of only 65 per cent although output
had more than doubled between 1976-77 and 1985-86.

Saharanpur, like Meerut, does not have as many units as the other three districts. It ranks last in terms of total production at all points of time and also in terms of total employment except for Meerut primarily because it has relatively fewer units except for Meerut.

The overall picture which emerges is that the five districts taken together account for very nearly 81 per cent of the value of total output and around 76 per cent of the total employment of the total Khandsari units of the state registered under the Factories Act (1989-90). However, only Moradabad and Meerut had a value added per worker higher than the state average. Another fact to be noticed is that 1982-83 is a year when the value added per worker has been the lowest in all the five districts as compared to the other three points of time. This is also the year when total output has also been lowest. This seems to be a problem year specific to these districts since the figures for the state as a whole do not conform to this pattern. In the case of the state as a whole the bad year is 1979-80 when both total output as well as value added per worker were the lowest.

We have utilised the data provided in the Annual Survey of Industries, U.P. to provide a picture of both Sugar as well as the Gur and Khandsari Industries since they provide a wide range of information relating to different aspects of the two industries. It was thus convenient to make use of the same even though information is available only upto the year 1985-86.

The Cane Commissioner's Office, on the other hand, provides upto date information upto the year 1989-90. But they provide

information only relating to total and working units, total
sugarcane crushed and production of different products quantity-
wise. This information is provided in Table 2.5 for the state as
a whole. It is quite evident from the Table that over the years
total number of units has been declining at a fairly fast rate.
However, the total quantum of cane crushed and therefore output
has shown an increasing trend. The picture is the same in the
case of the five selected districts with respect to total units.
However, there are variations in cane crushed and Khandsari
produced (Table 2.6).

As far as the sugarcane prices for the Khandsari units are
concerned we find that there has been a gradual increase in cane
prices over the years. In 1975-76 for instance the minimum cane
price paid by the Khandsari units was Rs.8.00 per quintal while
the maximum prices were Rs.18.00 per quintal. By the year 1989-90
minimum cane price had risen to Rs.18.00 while the maximum price
was Rs.50.00 per quintal. These were the average prices for the
state as a whole.

At the district level, there were variations except for
Bijnor and Moradabad which had prices similar to the state
average. All the remaining districts paid a higher minimum price
than the state average. This information was provided by the
respective Assistant Cane Commissioner's Offices of the selected
districts.

"Khara Kolhu" Units

Mention has already been made of the "khara kolhu" units in
the introdductory chapter. They along with the bullock kolhus are

the other units which are engaged in the processing of sugarcane. These are household units utilising mainly family labour. Prior to 1977 one had to obtain a license for setting up a 'khara kolhu' which is nothing but a power crusher with its rollers placed vertically instead of horizontally as in the case of the rollers of a Khandsari unit. Thus its crushing capacity is reduced. In 1977 the government made an alteration in its policy and spared the 'khara kolhu' from the formality of licensing and registration. Although, even now all individuals setting up a 'khara kolhu' are expected to register their names at the District Board but in practice there are much more units than the registration figures indicate. It is mainly the roadside units which get registered while those in the interior escape the notice of the District Board Officials. In fact since the District Board has no control over these units they do not even take pains to find the exact number.

On paper the rule clearly states that only sugarcane grown by the individual can be crushed by him in the 'khara kolhu' but the fact is that they are freely competing with the Khandsari units to purchase sugarcane produced in their area. Besides this some units are also producing Khandsari sugar even though they are expected to manufacture gur only.

In Moradabad they do not figure in large numbers but in the remaining districts of our study their number is quite high. In Bijnor and Meerut, for instance, the numbers registered with the District Board was 385 and 1800 respectively, it is believed that

the actual number would be close to around 2000 in Bijnor and around 6000 in Meerut.

It is quite true that recovery level of a 'khara kolhu' is lower as compared to the Khandsari unit. But they seem to make up for this loss by not having to pay the purchase tax of Rs.1.50 per quintal which the Khandsari units have to pay. They have neither to spend anything by way of license fee or incur any of the other expenses like hiring wages, interest etc. which the Khandsari units have to bear.

A 'khara kolhu' currently is priced at around Rs.25000. But one need not even purchase the unit. The manufacturers of the unit are giving them out on hire. The rent is around Rs.7500 for a crushing season. This cost is inclusive of other facilities such as setting up of the unit and also takes care of the day to day repairs. A mechanic is attached to a specified number of units and he goes around doing the repair work whenever needed.

These units are crushing around 200 quintals of sugarcane per day so in a crushing season of say seven months (October to April) each units crushes around 30000-40000 quintals of sugarcane. Thus even if we take the total number of such units at around 10000 in all the Khandsari producing districts we will find that they are crushing between 3 to 4 lakh quintals of sugarcane annually.

A small quantity of sugarcane is also crushed in the bullock driven kolhus. However details are not known about them.

Table 2.7 gives year-wise details of total sugarcane produced in the state and the quantum of sugarcane crushed in the sugar

mills as well as the Khandsari units of Uttar Pradesh. The share of the sugar mills as well as the Khandsari units shows considerable fluctuations over the years. The share of the sugar mills, which was 24.67 per cent in 1974-75, came to an all time low of 19.92 per cent in 1979-80. Then with year-wise fluctuations in between, it touched 31.99 per cent in the year 1986-87. By 1989-90 it had gone up further to 33.23 per cent.

In the case of the Khandsari units, on the other hand, the lowest share was 8.82 per cent during 1974-75 itself. After touching 13.75 per cent in 1977-78 it again slumped to 9.03 per cent the very next year. It attained an all time high of 15.15 per cent during 1986-87 but had come down to 11.53 per cent during 1989-90. Thus if we look at 1989-90 we find that if we account for the 33.23 and 11.53 per cent share of the sugar mills and Khandsari units respectively and add to it 17 per cent which is kept aside for seed etc. we have a figure of 61.76 per cent which means that the balance left is 38.24 per cent. The only other uses to which sugarcane is put to is crushing in the 'khara kolhus' or bullock driven kolhus and a very small amount reaches the cities where fresh sugarcane juice is sold. It is quite obvious that these uses cannot account for the balance which works out to be 3714.16 lakh quintals.

This leads to the obvious conclusion that either there is some error in the estimation of the total sugarcane output of the state or that the figures of cane crushed by the sugar mills and the Khandsari unit is an underestimate. In fact both may be true. This seems quite obvious since the sugarcane production has shown

an increasing trend except for some fluctuations. And if in any year the sugarcane had been left unsold in a big way it would have inevitably led to a great deal of dissatisfaction among the cultivators and the output would have been immediately affected.

While we have no way of finding as to how correct the state production estimates are we got some indications during the field visits that the estimates provided for crushing are underestimates in the case of both sugar mills as well as Khandsari units. A particular sugar mill is crushing much more amount of sugarcane daily than what it has mentioned as its daily crushing capacity. This unit alone is crushing around 50 lakh quintals more than its licensed capacity. As far as the Khandsari units are concerned, their case will be taken up in the subsequent chapters where we shall be analysing the primary data collected from the five selected districts.

A Comparative Picture of U.P. With India and Some States

It is worthwhile trying to have a comparative idea regarding the position of Uttar Pradesh with respect to sugarcane, sugar and khandsari to see how the state fares in comparison to the country as a whole and some other states. The states which are prominent in this connection are Tamil Nadu, Maharashtra and Andhra Pradesh and for the sake of convenience they have been taken for our comparative analysis.

The comparison in the case of sugarcane has been done with respect to the average yields obtained in these states and in the

country as a whole for about five years for which data was easily available. The years are 1982-83 to 1986-87. Average yield indicates the level of productivity of a particular crop. It is quite evident from the Table 2.8 that the average yield of sugarcane in Uttar Pradesh is lower than the all India average. Since the state has a much larger total area under sugarcane total production is the highest in absolute terms but the productivity levels are quite low. However, between 1982-83 and 1986-87 the average yield does indicate an increasing trend. It rose from 456.53 quintals per hectare in 1982-83 to 505.09 quintals per hectare by 1986-87. Even the all India figures have shown a similar increasing trend. Tamil Nadu has the highest yield rates after 1984-85 despite the fact that during 1982-83 and in the very next year the highest yield rates were in Maharashtra. However, while Tamil Nadu has maintained an increasing trend over the five years there has been a considerable decline in the yield rates in Maharashtra. It had an average yield of 962.56 quintals per hectare in 1982-83 which has declined to 860.71 quintals per hectare by the year 1986-87. Even Andhra Pradesh has a much higher average yield than Uttar Pradesh in all the years but there has been fluctuations in the yield rates. In 1982-83 it had the highest yield of 742.86 quintals per hectare which dropped to 688.54 qtls/hect. in the very next year. Yield went upto 726.32 qtls/hect. in 1985-86 but then again slumped to 639.16 qtls/hect. in 1986-87 which is the lowest for the five years.

When we look at the sugar industry we find that Uttar Pradesh has the highest number of sugar factories closely followed by

Maharashtra. These two states together account for around 54.5 per cent of the sugar factories in the country. They, therefore, are also crushing very high quantities of sugar cane. Their share was around 59 per cent during 1987-88 but came down slightly to 56 per cent during 1988-89. As against this Andhra Pradesh has only around 30 sugar factories while the number of factories in Tamil Nadu is only around 25. Despite the lower number of units a higher quantity of sugar cane is crushed in the units of Tamil Nadu. Thus when we look at the average cane crushed per unit Tamil Nadu stands high above the other states with an average annual crushing of 36.83 lakh qtls per unit (1988-89). The units of Andhra Pradesh were relatively small but those of U.P. and Maharashtra were close to the All India average of 23.41 lakh quintals per unit.

Just as we had observed that the average yield of sugarcane was the lowest in U.P., we similarly find that the sugar factories of Uttar Pradesh have the lowest recovery rate of sugar as well. The all India recovery rate was 9.70 per cent during 1987-88 and it rose to 10.21 per cent during the next year. For U.P. these recovery rates were 8.90 and 9.48 per cent respectively for the two years stated above. Although both Tamil Nadu and Andhra Pradesh had a higher recovery rate than U.P. these rates were below the national average. Maharashtra not only had the highest recovery rates but it was even higher than the all India average. However, U.P. has the highest recovery rate of molasses (4.46%) since its sugar recovery is lowest. On the contrary it is Maharashtra where the recovery rate of molasses is the lowest

(3.91%) since its efficiency in terms of sugar production is the best.

Looking at the change in the efficiency of the units Andhra Pradesh has registered an increase of 9.38 per cent in its recovery rates of sugar between 1987-88 and 1988-89 which was the highest among the four selected states. U.P. was second with an increase of 6.52 per cent. In Tamil Nadu the change was negligible (0.09%) (Table 2.9).

In the case of khandsari and gur data could not be had regarding statewise sugar cane crushed or the total number of khandsari units. We could only collect data for khandsari and gur produced and molasses produced (Table 2.10). In fact khandsari and gur production figures were not available for the state of Maharashtra. The three year data reveals that 1986-87 was possibly a bad year since khandsari and gur production have registered a decline in all the states and also in the all India figures. Among the three states for which khandsari and gur production figures are available Tamil Nadu has the highest production and it accounted for roughly 14 per cent of the total production in the country.

The figures of mollases production of the khandsari units reaffirm our stand that in the case of Uttar Pradesh the reporting of molasses production is grossly under estimated. Even a state like Andhra Pradesh where khandsari production is around half of what it is in U.P. the molasses produced is four times that reported by U.P.

Table 2.1 : Details of Sugar Industry for U.P. and
Selected Districts of the Study

Year	Return Recei- ved Units (Nos.)	Value of Fixed Capital (Lakh Rs.)	Working Capital (Lakh Rs.)	Total Employ- ment (Nos.)	Value of Total Inputs (Lakh Rs.)	Value of Total Outputs (Lakh Rs.)	Value Added (Lakh Rs.)	Value Added Per Worker (Rs.)
1	2	3	4	5	6	7	8	9

Uttar Pradesh

1976-77	78	5025.24	3221.22	126652	21425.19	27053.16	4988.01	4838
1979-80	85	11318.64	4091.62	122839	27198.12	32953.80	4096.03	4191
1982-83	91	14297.39	9135.73	118825	61490.30	74470.47	10728.50	11480
1985-86	91	19270.05	8654.64	61368	47404.12	67410.56	16338.92	35426

Bijnor

1976-77	3	157.74	242.61	3695	1498.57	1868.33	337.39	12436
1979-80	7	1294.00	228.52	6962	2290.46	2683.90	193.47	3602
1982-83	4	1062.96	46.68	4719	4173.05	5009.97	671.34	18418
1985-86	4	1552.96	207.32	3030	4055.03	6082.92	1686.25	76717

Muzaffarnagar

1976-77	4	155.71	24.83	91779	2157.01	2750.90	572.71	7120
1979-80	4	144.82	448.08	9882	1873.25	2457.76	545.02	6315
1982-83	4	942.91	(-)113.95	8471	5471.40	6396.54	801.16	10669
1985-86	5	1649.64	624.79	5487	5129.73	6670.01	1195.28	27434

Meerut

1976-77	5	447.85	230.65	8922	23336.25	2857.24	453.44	6584
1979-80	5	986.45	344.95	9923	2647.30	3122.36	345.24	4269
1982-83	7	1473.36	(-)175.65	10181	6974.97	8425.52	1178.94	15253
1985-86	4	1727.52	(-)443.52	3406	3782.71	4892.30	836.68	32941

Saharanpur

1976-77	5	224.76	2201.40	9730	1982.00	2405.79	390.52	4886
1979-80	5	457.00	278.98	8156	1888.34	2275.04	352.55	5295
1982-83	6	1293.50	441.92	10071	4860.07	4589.42	(-)432.26	(-)5191
1985-86	6	1135.46	90.89	4357	4536.58	8043.29	3299.65	95670

Source : Annual Survey of Industries, Economics and Statistics Division,
State Planning Institute, U.P. (Year-wise Reports)

Table 2.2 : Details of Cane Crushed, Production and Sugarcane
Prices for U.P.

Year	No.of Units	Cane Crushed (lakh qtl)	Sugar produ- ction (lakh qtl)	Molasses (lakh qtl)	Prices fixed by Govt. of India		Prices Paid by U. P. Govt.	
					Minimum	Maximum	Minimum	Maximum
1976-77	79	1515.30	147.10	64.41	8.50	10.80	12.25	13.25
1977-78	85	2054.40	186.20	96.84	8.00	11.00	12.50	13.50
1978-79	88	1576.40	146.30	68.57	10.00	12.71	10.00	12.71
1979-80	89	1020.30	99.70	41.73	12.50	16.03	12.87	22.00
1980-81	90	1293.50	122.40	54.54	13.00	17.28	19.00	26.00
1981-82	91	2278.50	208.00	103.91	13.00	16.52	20.50	21.50
1982-83	92	2104.00	293.50	91.97	13.00	16.67	20.50	21.50
1983-84	94	1851.40	172.70	83.06	13.50	18.90	20.50	21.50
1984-85	99	1544.80	147.70	67.77	14.00	17.46	21.00	22.00
1985-86	101	1721.70	164.80	76.74	16.50	20.58	23.00	24.00
1986-87	102	2711.00	255.60	124.90	17.00	22.00	24.00	25.00
1987-88	104	2996.50	266.60	149.87	18.50	24.10	26.00	27.00
1988-89	104	2429.30	230.20	108.31	19.50	23.63	28.50	30.00
1989-90	104	3328.00	300.00	NA	22.00	28.49	38.00	38.00

Source : Cane Commissioner's Office, Lucknow

Table 2.3 : Details of Cane Crushed and Production of Sugar Industries for Selected Districts

District	Year	No. of Units	Cane Crushed (lakh qtl)	Sugar Production (lakh qtl)	Molasses (lakh qtl)
Bijnor	1987-88	4	235.03	21.25	12.13
	1988-89	4	176.43	17.18	7.49
	1989-90	5	286.92	25.82	13.05
Moradabad	1987-88	3	65.56	5.42	3.57
	1988-89	3	53.97	5.13	2.65
	1989-90	3	97.11	8.16	4.83
Muzaffarnagar	1987-88	5	229.09	19.85	10.73
	1988-89	5	190.40	18.26	7.70
	1989-90	5	268.67	24.10	24.10
Meerut	1987-88	7	299.45	34.83	15.63
	1988-89	7	167.24	33.55	10.28
	1989-90	7	297.53	36.63	19.06
Saharanpur	1987-88	6	260.17	23.00	10.84
	1988-89	6	188.53	17.32	7.75
	1989-90	6	303.44	27.47	13.54

Source : Cane Commissioner's Office, Lucknow

Table 2.4 : Details of Khandsari Industry for U.P. and
Selected Districts of the Study

Year	Return Recei- ved Units (Nos.)	Value of Fixed Capital (Lakh Rs.)	Working Capital (Lakh Rs.)	Total Employ- ment (Nos.)	Value of Total Inputs (Lakh Rs.)	Value of Total Outputs (Lakh Rs.)	Value Added (Lakh Rs.)	Value Added Per Worker (Rs.)
Uttar Pradesh								
1976-77	740	1243.04	443.85	58048	5858.99	7071.16	1085.63	2074
1979-80	790	1477.43	776.62	48479	4181.05	5310.57	973.31	1598
1982-83	1152	2045.59	1056.77	102829	15842.78	18769.39	2605.84	2802
1985-86	968	2734.15	1892.25	80124	17989.68	20878.95	2535.14	3551
Bijnor								
1976-77	221	313.37	101.33	16170	1601.88	1928.38	295.94	2009
1979-80	222	374.59	164.99	19373	1173.10	1470.49	259.67	1475
1982-83	245	652.52	181.61	21328	3530.22	4191.73	580.79	2987
1985-86	208	573.17	283.76	18676	3464.20	4069.36	522.05	3141
Moradabad								
1976-77	59	184.98	75.88	7077	737.99	950.64	191.0	3011
1979-80	93	243.43	179.36	10734	691.21	895.47	174.18	1857
1982-83	174	685.80	247.57	20602	3067.97	3749.49	598.34	3195
1985-86	192	633.21	414.67	16150	3268.14	3875.80	518.84	3670
Meerut								
1976-77	37	75.00	29.27	2436	371.45	458.03	78.52	3556
1979-80	52	124.99	51.20	3841	351.97	444.47	80.56	2365
1982-83	108	255.76	102.25	8793	1563.77	1814.56	225.33	2859
1985-86	86	281.78	80.35	6930	2234.46	2577.30	316.18	5096
Muzaffarnagar								
1976-77	178	223.72	86.04	13684	1635.05	1911.67	255.92	2081
1979-80	146	233.23	146.98	12275	729.33	836.16	110.34	1017
1982-83	267	433.14	205.98	21669	3515.45	4016.42	453.15	2287
1985-86	186	373.73	308.14	13766	4441.10	4913.67	431.05	3443
Saharanpur								
1976-77	78	94.46	43.36	5409	527.65	616.31	79.70	1643
1979-80	111	138.85	66.04	7062	519.53	606.00	73.04	1198
1982-83	124	152.85	78.88	8016	1115.11	1291.78	161.12	2232
1985-86	91	121.44	130.93	5772	1255.26	1443.65	175.33	3393

Source : Annual Survey of Industries, Economics and Statistics Division,
State Planning Institute, U.P. (Year-wise Reports)

Table 2.5 : Data Relating to Khandsari Units of U.P.

Licensed Units	Working Units	Cane Crushed (lakh qtl)	Khandsari Produced (lakh qtl)	Gur Produced (lakh qtl)	Molasses Produced (lakh qtl)	Price of Cane Per Quintal (Rs.)	
						Minimum	Maximum
4077	3500	550.20	23.06	7.51	13.60	8.00	18.00
2875	2636	805.62	33.09	6.15	12.78	10.00	22.00
2813	2501	901.48	45.25	15.13	NA	10.00	22.00
2761	2184	972.72	48.01	11.39	4.35	8.00	25.00
2374	2041	909.97	39.42	14.60	6.54	8.00	21.00
2077	1808	828.81	39.00	10.04	6.16	10.00	30.00
1940	1744	1021.27	48.09	23.48	4.08	13.00	33.00
1874	1767	1283.24	66.35	15.56	2.23	10.00	33.00
1615	1666	1254.54	53.05	19.01	6.65	10.00	29.00
1744	1600	1199.33	51.04	20.30	0.69	15.00	40.00
1641	1552	1119.93	51.14	20.65	4.36	18.00	50.00

Source : Cane Commissioner's Office, Lucknow

Table 2.6 : Details of Selected Districts Regarding Gur and Khadsari Units

Licensed Units	Working Units	Cane Crushed (lakh qtl)	Khandsari Produced (lakh qtl)	Gur Produced (lakh qtl)	Molasses Produced (lakh qtl)	Price of Cane Per Quintal (Rs.)	
						Minimum	Maximum
197	168	190.27	7.90	4.25	0.26	10.00	29.00
194	178	181.12	7.37	4.42	0.11	15.00	40.00
193	181	185.82	7.04	4.66	0.08	18.00	50.00
152	143	125.04	4.40	2.91	0.53	25	38
144	137	126.73	5.14	3.05	0.12	25	40
132	130	109.13	4.01	3.01	0.18	30	48
150	133	92.47	2.98	3.02	0.08	18	28
143	134	88.98	2.90	2.87	NA	24	35
136	134	78.67	2.55	2.37	0.13	26	40
207	192	166.24	6.21	4.56	0.02	NA	NA
195	181	148.61	6.41	4.58	NA	26	38
174	168	150.81	6.01	4.19	NA	26	40
292	267	199.99	9.11	2.01	NA	20	28
283	250	180.44	8.41	2.32	NA	24	36
264	237	187.15	8.33	2.47	NA	18	50

Source : Assistant Cane Commissioner's Office of respective Districts.

Table 2.7 : Sugarcane Produced and Sugarcane Crushed by
Different Sources

Year	Total Pro- duction of Sugarcane (lakh qtl)	Total Sugar- cane Crushed by Sugar Mills (lakh qtl)	Total Sugar- cane Crushed by Khandsari Units (lakh qtl)	Balance Sugarcane (lakh qtl)
1974-75	6147.92 (100.00)	1516.90 (24.67)	542.57 (8.82)	4088.45 (66.51)
1975-76	5835.90 (100.00)	1222.20 (20.94)	550.20 (9.43)	4063.50 (69.63)
1976-77	6521.55 (100.00)	1515.30 (23.24)	671.07 (10.29)	4335.10 (66.47)
1977-78	7681.86 (100.00)	2054.40 (26.74)	1056.18 (13.75)	4571.28 (59.51)
1978-79	6232.42 (100.00)	1576.40 (25.29)	562.99 (9.03)	4093.03 (65.68)
1979-80	5122.84 (100.00)	1020.30 (19.92)	555.56 (10.84)	3546.98 (69.24)
1980-81	6420.49 (100.00)	1293.50 (20.15)	˙805.62 (12.54)	4321.37 (67.31)
1981-82	7644.01 (100.00)	2278.50 (29.81)	901.48 (11.79)	4464.03 (58.40)
1982-83	8138.67 (100.00)	2104.00 (25.85)	972.72 (11.95)	5061.95 (62.20)
1983-84	7829.38 (100.00)	1851.40 (23.65)	909.97 (11.62)	5068.01 (64.73)
1984-85	7088.82 (100.00)	1544.80 (21.79)	828.81 (11.62)	4715.21 (66.73)
1985-86	7303.68 (100.00)	1721.70 (23.57)	1021.27 (13.98)	4560.71 (62.45)
1986-87	9305.40 (100.00)	2996.50 (31.99)	1283.24 (15.15)	4479.38 (52.86)
1987-88	9305.40 (100.00)	2996.50 (32.20)	1254.54 (13.48)	5054.36 (54.32)
1988-89	8852.27 (100.00)	2429.30 (27.44)	1199.33 (13.55)	5223.64 (59.01)
1989-90	9712.77 (100.00)	3228.00 (33.23)	1119.93 (1.53)	5364.84 (55.24)

Source : Cane Commissioner's Office, Lucknow

Note : Figures in brackets indicate the percentages of total
sugarcane production.

Table 2.8 : A Comparative Picture of the Yield Rates of
Sugarcane

Yield = Qtls/Hect

State	1982-83	1983-84	1984-85	1985-86	1986-87
Uttar Pradesh	456.55	463.54	459.36	490.19	505.09
Tamil Nadu	871.63	873.97	1038.01	1046.82	1100.04
Andhra Pradesh	742.86	688.54	711.05	726.32	639.16
Maharashtra	962.56	903.03	901.14	893.54	860.71
India	564.41	559.78	576.73	598.89	597.32

Source : (i) Directorate of Agriculture U.P. for the figure of
U.P. and India
ii) Directorate of Economic and Statistics, Ministry of
Agriculture, New Delhi for the states of Tamil
Nadu, Andhra Pradesh and Maharashtra.

Table 2.9 : Details of Cane Crushed, Sugar and Molasses Produced
in the Sugar Factories of the Selected States.

State	No. of Sugar Facto- ries	Sugar Cane Crushed (Lakh Qtls)	Sugar Produ- ced (Lakh qtls.)	Molasses Produced (Lakh Qtls)	Recovery Rates (%) of Sugar
Uttar Pradesh					
1987-88	104	2996.50	266.60	149.87	8.90
1988-89	104	2429.30	230.20	108.31	9.48
Tamil Nadu					
1987-88	25	850.50	78.50	36.59	9.23
1988-89	27	994.30	100.40	43.36	10.10
Andhra Pradesh					
1987-88	30	593.40	54.40	27.49	9.17
1988-89	31	505.50	50.70	22.02	10.03
Maharashtra					
1987-88	90	2583.70	279.50	103.00	10.82
1988-89	95	2380.60	262.90	92.97	11.04
INDIA					
1987-88	356	9394.30	911.00	420.60	9.70
1988-89	366	8569.30	875.20	360.60	10.21

Source :   (i)   Cane Commissioner's Office, Lucknow for Uttar
                 Pradesh
          (ii) National Federation Cooperative Sugar Factories
                Ltd., New Delhi, Vol.21, May 1990 for India and the
                States except U.P.

Table 2.10 : Details of Khandsari, Gur and Molasses Produced in the Khandsari Units of Selected States.

State	Khandsari and Gur Produced			Molasses Produced		
	1985-86	1986-87	1987-88	1985-86	1986-87	1987-88
Uttar Pradesh	71.57	81.91	72.06	4.08	2.23	6.65
Tamil Nadu	119.00	113.80	115.70	36.50	36.30	36.50
Andhra Pradesh	NA	25.90	37.10	18.60	26.30	27.40
Maharashtra	NA	NA	NA	81.40	85.20	103.00
INDIA	834.40	793.10	829.50	284.90	366.20	420.60

Source : (i) Cane Commissioner's Office, Lucknow for the data on U.P.

(ii) National Federation Cooperative Sugar Factories Ltd., New Delhi, Vol.21, May 1990 for data on India and the States except U.P.

Chapter III

CHARACTERISTICS OF THE KHANDSARI UNITS AND THE ENTREPRENEURS

The previous chapter gave information regarding the khandsari sector based on secondary data. We will now analyse the primary information collected by us through a field survey of the five districts selected from the Western region of Uttar Pradesh where the khandsari units are mainly concentrated. A total of 126 units have been covered from the sample districts. We shall, in this chapter, deal with the basic characteristics of the khandsari units with respect to their age, type of ownership, size of crusher installed and the quantum of cane crushed in them. Besides this, the chapter also deals with some basic characteristics of the entrepreneurs regarding their age, education and background.

Being a weight loosing type of industry the locational advantage of a khandsari unit lies in being located in close proximity of the sugarcane growing areas. Whereever possible, the entrepreneur also tries to locate his unit close to the roadside such that transportation of sugarcane as well as the finished products can be facilitated.

Establishment of the unit

The general impression which had been conveyed to us by the Cane Commissioner's Office, Lucknow was that the government policy has been to discourage the khandsari sector by not providing new

licenses except in special circumstances. It had been pointed out that new licenses had been granted mainly when the state had witnessed a bumper sugarcane production. In order to protect the interest of the farmer it was necessary to ensure that the surplus sugarcane does not remain unsold. Consequently the state policy was altered and new licenses issued.

The findings of the survey, by and large, conform to the above impression since nearly 69 per cent of the total sample units were established prior to 1975. On the other hand, only around 14 per cent units have been set up in the 1980's. Looking at the districts individually, Saharanpur and Bijnor stand out as the districts with the oldest khandsari units since over four-fifths of its units were established before 1975. On the other hand, Meerut was the district where the share of newly established units was found to be the highest. Over half the units were set up after 1975. In fact more than one-third of the units came up during the 1980's. Since Meerut is a very prosperous district it could be possible that entrepreneurs could exert their influence in order to set up new units in the district. Even Moradabad has a fairly high proportion of new units (44%) (Table 3.1).

Although khandsari units come under the category of small scale industry, the overall investment is quite sizeable. The complete plant costs around Rs.14.00 lakhs (1990 prices). Besides this, since power supply in the state is irregular, the units have to instal their own generating sets to ensure that the production process is not disturbed. The unit also has to have a fairly big

land area to keep a stock of sugarcane and also to spread the
bagasse out in the sun so that it dries up early and can then be
used as fuel for the open pans. The units being mainly owned by
the rural people, it becomes difficult to raise this type of
finances individually. Thus we find that the units are mainly
partnership units where, at time, as many as six or seven persons
jointly own a khandsari unit. Many a time they are relatives or
are close associates. On the whole, therefore, around 81 per cent
of the total units of the five sample districts were found to be
partnership concerns while less than one-fifth were owned by
single entrepreneurs. Among the individual districts Meerut had
the highest proportion of partnership units (94.12%). On the
other hand Saharanpur had the highest percentage of individually
owned units (30%). The remaining districts were close to the all
district average (Table 3.1).

Size of the Crusher and Process of Production

Although there are four main sizes of crushers available,
only three were found in the districts selected by us. These
sizes are 10" x 12", 11" x 14" and 13" x 18". Normally each unit
has only one crusher but in the case of Bijnor there were two
units and one in the case of Moradabad which had two crushers
each. Moreover, the crusher size of 10" x 12" was found only in
Muzaffarnagar. The 11" x 14" crusher dominates in all the five
districts and it accounts for nearly 69 per cent of the total
crushers. Saharanpur has only this crusher in all its units
followed by Bijnor (79%) and Muzaffarnagar (70%). The biggest
sized crusher (13" x 18") accounts for slightly over one-fourth of

the total crushers and is concentrated mainly in Moradabad (58%) and Meerut (41%).

Khandsari is manufactured through two main processes namely sulphitation and non-sulphitation methods. In our sample around 63 per cent units were sulphitation units while the rest were non-sulphitation units. The non-sulphitation units concentrate on the production of gur. In the case of Meerut our sample constituted of only sulphitation units while in Saharanpur we had a total sample of only non-sulphitation plants. In the remaining districts Moradabad and Bijnor had a high proportion of sulphitation units while in Muzaffarnagar the proportion of non-sulphitation units was found higher (Table 3.2).

Sugarcane Crushed and Recovery Rates

In order to have an idea of the amount of cane crushing carried out by the different khandsari units we have clubbed the units on the basis of the quantum of sugarcane crushed by them, by distributing them into six size groups starting from below 50,000 quintals and going upto over 2 lakh quintals of sugar cane during the 1989-90 season (Table 3.3).

The lowest size group is found in Saharanpur and Muzaffarnagar only. In fact the units of Saharanpur were small thus this size group accounted for 70 per cent of the total units. In Saharanpur only 2 units were in the size group 76-100 thousand quintals, and this was the highest size group for the district. On the contracy, Meerut was the district with bigger sized units.

Over 94 per cent of the total units were crushing above 100 thousand quintals. Moradabad was second with around 72 per cent uinits. Muzaffarnagar and Bijnor were the districts where both large and small sized units were almost evenly distributed. Taking the districts together the highest proportion of units (31%) were concentrated in the size group of 101-150 thousand quintals. Nearly half the units are found to be crushing over 101 thousand quintals.

The total sugar cane crushed by all the units taken together accounts for 14130 thousand quintals during 1989-90 and this gives an average cane crushed per unit of 112.14 thousand quintals for all the units taken together. Among the districts we find wide variations ranging from the lowest average of 49 thousand quintals per unit in Saharanpur to the highest average of 144.41 thousand quintals per unit in Meerut. Moradabad and Bijnor have around the same average which is slightly higher than the overall average.

The structured questionnaire prepared for the survey had also asked the units to furnish details regarding their recovery rates of khandsari as well as khandsari molasses. It is observed that there are wide variations among the districts with respect to recovery rates of both khandsari and khandsari molasses. Meerut had the highest recovery rate as far as khandsari is concerned. With a recovery of 6.37 per cent. Since the best recovery rate which can be obtained in a sulphitation unit is 7 per cent, it may be said that the efficiency of the units located in Meerut is quite good. Meerut, as already indicated had only sulphitation units. Both Moradabad and Bijnor had the same recovery rate of

5.64 per cent. The remaining districts Muzaffarnagar and Saharanpur also had almost the same recovery rate but it was extremely low at less than 4.5 per cent. Part of this low recovery is explained by the fact that the units of these districts are mainly non-sulphitation units. Their low recovery rates have pulled down the average recovery for the five districts taken together (5.33%).

Looking at the recovery rates of khandsari molasses Muzaffarnagar heads the other districts with a recovery rate of 5.75. Saharanpur, although second, is considerably behind it with a recovery of 4.85 per cent. It is interesting to note that in both these districts the recovery rate of molasses is higher than the recovery rate of khandsari. In the remaining three districts the recovery rates of molasses are very nearly the same at around 4 per cent. The average recovery rate for the five districts taken together works out to be 4.37 per cent (Table 3.3).

It is, therefore, observed that the khandsari units are generally old except in the case of Meerut and Moradabad and that a very high proportion of the units are partnership concerns. They are producing khandsari sugar through the open-pan sulphitation method except for the two districts of Saharanpur and Muzaffarnagar, and are using the crusher which has a size of 11" x 14". Whereas the units of Meerut are crushing highest amount of sugarcane per unit those in Saharanpur are relatively smaller sized and thus crushing a much lower quantity of sugar cane per unit. The efficiency of units being more in Meerut is amply reflected in the higher recovery rate of khandsari.

We will now focus our attention on the characteristics of the entrepreneurs running the khandsari units. Since most units are partnership concerns it was not possible to interview all partners. We have, therefore, collected information of that partner who generally looks after the unit in question. Thus the analysis which follows relates to all such partners who are actually running the unit. There is, of course, no problem related to units which were individually owned.

Age of the Entrepreneur

Very few entrepreneurs were found to be young (below 30 years). In the overall sample their percentage was only around 10. Entrepreneurs were mainly concentrated in the age groups 31-40 years and 41-50 years. The two age groups taken together accounted for nearly 70 per cent of the entrepreneurs. The remaining entrepreneurs were in the age group of over 51 years. The average age of the entrepreneurs for the districts taken together worked out to be around 43 years. There was not much difference among the five districts in this regard. However, in the case of Meerut around 41 per cent entrepreneurs were above 51 years (Table 3.4).

Educational Level and the Origin of Entrepreneurs

It was very encouraging to note that all the entrepreneurs were educated. In fact, there was only one unit in Bijnor whose owner was an illiterate person. Not only were the entrepreneurs educated, they were well qualified as well since over half of them

were either graduates or post-graduates. Besides them another 11
per cent were technical persons with an engineering degree or
diploma. The remaining, though lesser qualified, had at least
secondary level of education. The highest percentage of
technically qualified persons was found in Meerut (29%). This
possibly explains why the efficiency of the units of Meerut was
found to be high as compared to the other districts.

The enquiry into the background of the entrepreneurs of the
khandsari units revealed that around 60 per cent had a rural
background. The proportion of rural entrepreneurs was almost the
same in all districts except for Moradabad where they accounted
for only one-fourth. This brought down the overall average for
the districts taken together. In view of the fact that such a
high percentage of entrepreneurs have a rural origin it is very
commendable that they are well educated (Table 3.5).

While we observed that a high percentage of the entrepreneurs
have a rural background, the percentage of those who have land of
their own is rather low. Only around 44 per cent entrepreneurs
have reported to own some agricultural land. The percentage is
highest in the case of Moradabad and Bijnor. Interestingly, a
majority of the entrepreneurs of Moradabad have an urban and not a
rural background which shows that they acquired this land only
after setting up their units in Moradabad.

The average land holding among the entrepreneurs of the five
districts works out to be 5.33 acres. Average holding is highest
in the case of Bijnor (8.54 acres) and lowest in Meerut (2.64

acres). Only around half the total available land area has been utilised for the cultivation of sugarcane. In Saharanpur only around 18 per cent of the average land holding is put under sugarcane. However, in the case of Muzaffarnagar this percentage (61) is the highest. Muzaffarnagar, as we know, is the most important sugarcane growing district of the state and so this high percentage is quite natural. The average area under sugarcane varied from a low of 0.80 acres in Saharanpur to a high of 4.95 acres in Bijnor and the overall average for all the districts taken together worked out to be 2.62 acres (Table 3.6).

The overall picture regarding the characteristics of the entrepreneurs bring out the fact that the entrepreneurs are generally in the age group 31-50 years except for in Meerut where a relatively high percentage fall in the age group of above 51 years.   A majority of them have a rural background except in the case of Moradabad. However, despite their rural background they are all well educated and some even have technical qualifications. Since the entrepreneurs are basically engaged in running their units they have not been interested in agriculture as is reflected by the small land holdings in their possession.

Table 3.1 : Distribution of Units by year of Establishment and Type of ownership

Year of Establishment	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Total Number of Units	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)
Before 1970	1 (5.88)	7 (21.88)	6 (30.00)	8 (40.00)	14 (37.84)	36 (28.57)
1970 - 75	7 (41.18)	11 (34.37)	8 (40.00)	9 (45.00)	16 (43.24)	51 (40.48)
1975 - 80	3 (17.65)	6 (18.75)	4 (20.00)	2 (10.00)	6 (16.22)	21 (16.66)
1980 and after	6 (35.29)	8 (25.00)	2 (10.00)	1 (5.00)	1 (2.70)	18 (14.29)
Type of ownership						
Owned	1 (5.88)	6 (18.75)	5 (25.00)	6 (30.00)	6 (16.22)	24 (19.05)
Partnership	16 (94.12)	26 (81.25)	15 (75.00)	14 (70.00)	31 (83.78)	102 (80.95)

Note : Figures in brackets indicate the percentages to total units

Table 3.2 : Distribution of Units by Size of Crushers and Type
of Manufacturing Process

Crusher Size/ Process	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Size of Crusher (in inches)						
8 x 10	–	–	–	–	–	–
10 x 12	–	–	5 (25.00)	–	–	5 (3.88)
11 x 14	10 (58.18)	14* (42.42)	14 (70.00)	20 (100.0)	31* (79.49)	89* (68.99)
13 x 18	7 (41.18)	19 (57.58)	1 (5.00)	–	8 (20.51)	35 (27.13)
Total	17 (100.00)	33 (100.00)	20 (100.00)	20 (100.00)	39 (100.00)	129 (100.00)
Units Having mor than one crusher	–	1*	–	–	2*	3*
Type of Process						
Sulphitation	17 (100.00)	30 (93.75)	2 (10.00)	–	30 (81.08)	79 (62.70)
Non-Sulphitation	–	2 (6.25)	18 (90.00)	20 (100.00)	7 (18.92)	47 (37.30)
Total Units	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)

Note : Figures in brackets indicate percentages to total.

Table 3.3 : Distribution of Units by Quantum of Cane Crushed During
1989-90 and Percentage Recovery of Khandsari Sugar and
Molasses.

Cane Crushed/ Recovery	Meerut	Moradabad	Muzaffar- nagar	Saharan- pur	Bijnor	All Districts
Quantum of Sugar cane crushed (000 Qtls)						
Less than 50	–	–	4 (20.00)	14 (70.00)	–	18 (14.29)
51 – 75	1 (5.88)	5 (15.62)	3 (15.00)	4 (20.00)	8 (21.62)	21 (16.67)
76 – 100	–	4 (12.50)	3 (15.00)	2 (10.00)	11 (29.73)	20 (15.87)
101 – 150	7 (41.18)	13 (40.63)	7 (35.00)	–	12 (32.43)	39 (30.95)
151 – 200	6 (35.29)	10 (31.25)	1 (5.00)	–	3 (8.11)	20 (15.87)
Above 200	3 (17.65)	–	2 (10.00)	–	3 (8.11)	8 (6.35)
Total Cane Crushed (000 Qtls.)	2455	4049	2014	980	4632	14130
Average Cane Crushed per Unit (000 Qtls)	144.41	126.52	100.70	49.00	125.19	112.14
Total Units	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)
Recovery % of Khandsari	6.37	5.64	4.40	4.32	5.64	5.33
Molasses	4.06	3.71	5.75	4.85	3.92	4.37

Note : Figures in brackets indicates the percentage of column totals.

Table 3.4 : Age of the Entrepreneurs.

Age group (Years)	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Below 30	3 (17.65)	4 (12.50)	2 (10.00)	3 (15.00)	1 (2.70)	13 (10.31)
31 - 40	4 (23.53)	13 (40.63)	6 (30.00)	9 (45.00)	16 (43.24)	48 (38.10)
41 - 50	3 (17.65)	9 (28.12)	9 (45.00)	6 (30.00)	13 (35.14)	40 (31.75)
Above 51	7 (41.18)	6 (18.75)	3 (15.00)	2 (10.00)	7 (18.92)	25 (19.84)
Total	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)
Average Age	43.76	41.87	44.80	41.00	43.06	42.80

Note : Figures in brackets indicate the Percentage to column total

Table 3.5 : Educational Levels and the Origin of the Entrepreneurs

Level of Education	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Illiterate	–	–	–	–	1 (2.70)	1 (0.79)
Secondary	4 (23.53)	6 (18.75)	11 (55.00)	11 (55.00)	15 (40.54)	47 (37.31)
Graduates and Post Graduates	8 (47.06)	20 (62.50)	8 (40.00)	7 (35.00)	21 (56.76)	64 (50.79)
Technical/ Professional	5 (29.41)	6 (18.75)	1 (5.00)	2 (10.00)	–	14 (11.11)
Background of Entrepreneurs						
Rural	12 (70.59)	8 (25.00)	15 (75.00)	15 (75.00)	28 (75.68)	78 (61.90)
Urban	5 (29.41)	24 (75.00)	5 (25.00)	5 (25.00)	9 (24.32)	48 (38.10)
Total	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)

Note : Figures in brackets indicate the percentages to total

Table 3.6 : Details of Land Holdings and Area Under Sugarcane.

(Area in Acres)

Description	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Total Number of Units	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)
Number of Units Having Land	3 (17.65)	18 (56.25)	6 (30.00)	8 (40.00)	21 (56.76)	56 (44.44)
Land Holding						
Total — Actual	45	144	76	91	316	62
Average	2.64	4.50	3.90	4.55	8.54	5.33
Under Sugar Cane						
Actual	26	60	46	16	183	331
Average	1.53	1.87	2.30	0.80	4.95	2.62
Percentage of Area Under Sugar cane	57.78	41.67	60.52	17.58	57.91	50.05

Note : Figures in brackets indicate the percentage to total.

Chapter IV

CAPITAL LABOUR AND EXPENDITURE PATTERN OF THE KHANDSARI UNITS

In the preceeding chapter we had dealt with the general characteristics of the khandsari units as well as the basic characteristics of the entrepreneurs running those units. We now turn our attention towards capital and labour employed and on the expenditure pattern of the khandsari units covered by us from the selected districts. The information relates to the 1989-90 crushing season.

Land and Building

A khandsari unit needs sufficient land area for two main purposes besides housing the plant and machinery. It needs a lot of space to pile up the sugarcane. Moreover, it needs a sizeable area to spread the bagasse in order to let it dry. Bagasse is a major fuel input for boiling the sugarcane juice for the manufacture of khandsari. We, therefore, observe that a fair investment has been made in land and building by the khandsari units. In our sample districts taken together only 16 per cent units fall in the size group of below Rs.1 lakh while a major chunk (over 71%) have a value of land and building in the size group of Rs.1 - 4 lakhs. Another 12 per cent units have land and building worth over Rs.4.00 lakhs. The remaining units (around 2 per cent) failed to provide information about the value of land and building. The average value of land and building for all the units taken together was found to be Rs.1.85 lakhs. They vary

among the districts significantly for we have on one hand Meerut where the average value is Rs.4.20 lakhs while on the other hand the average value in Saharanpur is only Rs.0.68 lakhs. There was not much variation between the remaining districts.

Keeping in mind the fact that quite a few of these units are fairly old and also that they are located in rural areas where land costs are relatively low these values are quite high. In the case of Meerut we had found that the average value of land and building was the highest. This is so partly because the units of Meerut are quite big. Moreover, Meerut also has a high proportion of units established during the 1980's by when the land and the construction costs had gone up. On the contrary the average value is quite low in the case of Saharanpur where the units are relatively much smaller (Table 4.1).

Value of Plant and Machinery

The figures of plant and machinery provided by the units are depriciated values and not the original purchase price. The khandsari units of the sample districts are mainly concentrated in the size group upto Rs.6 lakhs (87%). In fact the maximum concentration is in the size group Rs.1 - 2 lakhs. Consequently only a few units have a value of plant and machinery above Rs.6 lakhs. In fact it is only in the case of Meerut where over 64 per cent units have plant and machinery valued at over Rs.6 lakhs. This is quite understandable since these units are new units and so their depriciated values are also fairly high. Moreover, they are all sulphitation units whose cost is higher as compared to the

non-sulphitation units. A new khandsari unit producing khandsari through the sulphitation method was priced at around Rs.14 lakhs in 1989-90. Thus we find the high average value for Meerut. On the other hand, Saharanpur had only non-sulphitation units and so the average value is not even Rs.1 lakh per unit and all the units fall in catagories upto Rs.4 lakhs. Even in Muzaffarnagar the average value is low since this district too has a high percentage of non-sulphitation units. In fact only Moradabad and Bijnor are the districts which have a few units where the value of plant and machinery exceeds Rs.6 lakhs. The average value for all districts taken together works out to Rs.2.54 lakhs (Table 4.2).

Total Fixed Capital

Total fixed capital is the combitation of land and building as well as plant and machinery. In distributing the units according to their size of fixed capital we find that over 50 per cent units are in the size group between Rs.2 - 4 lakhs. Since Saharanpur and Muzaffarnagar had smaller units only some units from these districts are found to have a fixed capital size of below Rs.2 lakhs. Similarly, since Meerut has new and large sized units it has over 50 per cent units where value of fixed capital exceeds Rs.10 lakhs. The only other district having units with fixed capital in excess of Rs.10 lakhs is Bijnor. Meerut, as already indicated, had a higher value of both land and building as well as plant and machinery. Thus in the case of Meerut only around 11 per cent units have a fixed capital size below Rs.2.00 lakhs. The average value of fixed capital for all the districts

taken together is just short of Rs.4.5 lakhs. Moradabad and Bijnor have figures close to this average value. The average value is much lower in the case of Saharanpur (Rs.1.66 lakhs) and more than twice the overall average in the case of Meerut (Rs.10.08 lakhs) (Table 4.3).

Working Capital

Working capital is essential to ensure smooth working of a unit. Since sugarcane has to be purchased in advance and so is money needed to make payment for other inputs and wages etc. every unit has to keep a provision of working capital depending upon its requirements. Most of the sample units (48.4%) from all the districts taken together have a working capital size of Rs.1 - 2 lakhs. Not much difference is found among the individual districts. The next important size group is Rs.2 - 4 lakhs (27%). These two size group, therefore, jointly account for around three-fourths of the total units. Here too there is not much difference among individual districts except that Meerut has only a small proportion of units in this size group.

As we move to the higher size groups of working capital beyond Rs.4 lakhs the representation of Saharanpur and Muzaffarnagar ends. Even that of Moradabad ends when we talk of working capital in excess of Rs.6 lakhs. It is only in some units of Meerut and Bijnor that the size of working capital goes beyond Rs.6 lakhs.

On the whole the average value of working capital works out to around Rs.2.5 lakhs. The value is, of course, much higher for Meerut as compared to the remaining districts (Table 4.4).

Productive Capital

Productive capital represents a combination of fixed and working capital. For the purpose of analysis the productive capital too was divided into various size groups as was done with the other forms of capital. The lowest size group was below Rs.5.00 lakhs while the highest size group taken was that where the value of productive capital exceeded Rs.20 lakhs. As productive capital is a combination of the fixed and working capital and that these are both influenced by the size of the unit, the results obtained followed the pattern which had been obtained in the case of fixed and working capital individually. Among the individual districts, therefore, Meerut was far ahead of the other districts with an average per unit productive capital to the tune of Rs.14.20 lakhs. Very nearly 59 per cent of the units had a productive capital size of over Rs.15 lakhs. In the second position, though lagging far behind, were Bijnor and Moradabad where the average productive capital per unit was just short of Rs.7 lakhs each. Both Saharanpur and Muzaffarnagar had a small overall size of productive capital and consequently even the average per unit was of a much lower order. The average size of productive capital for the districts taken together was Rs.6.89 lakhs.

In the overall picture the lowest size group of below Rs.5 lakhs was where most units (46%) were concentrated followed by the immediately next higher size group (31%). These two, therefore, jointly accounted for over three-fourths of the total units.

Roughly 13.5 per cent units had a productive capital ranging between Rs.10-15 lakhs while the remaining units had a value of productive capital in excess of Rs.15 lakhs (Table 4.5).

Capital Efficiency

Capital efficiency has been analysed in terms of the per worker value of plant and machinery, fixed and productive capital. All these figures indicate that the industry is a traditional one since the figures, whether for individual districts or for the five districts taken together, are low. This, therefore, shows that the per worker investment is low and that the industry is rather labour intensive. The overall value of plant and machinery per worker was not even rupees two thousand whereas the average value of fixed capital per worker was below Rs.4500. Even in the case of productive capital the per worker figure was around Rs.6600 only. However, there was a reasonable variation among the individual districts in each case indicating differences in capital efficiency between the five districts. Capital efficiency for all the three indicators was the lowest in the case of Moradabad. Its value of plant and machinery per worker was only Rs.1747. There was hardly any variation between Muzaffarnagar, Saharanpur and Bijnor. However, the value in the case of Meerut (Rs.3852) was the highest. In the case of fixed capital as well as productive capital, Meerut again had the highest value per worker. Once again there was not much difference between Muzaffarnagar, Saharanpur and Bijnor. It is, therefore, clear that the khandsari industry is not one of the industries which is

capital intensive. The plants are fairly old and there is no
scope for modernisation and adoption of new technology.
Consequently the three indicators of capital efficiency do not
have high values (Table 4.6).

Employment and Wages in Khandsari Units

The khandsari industry is a seasonal one in which the
crushing of sugarcane is carried out for around seven months every
year. Thus, it does not offer much scope for offering
opportunities of regular employment. However, each unit has to
keep some key persons such that the crushing can begin smoothly
when the crushing period begins. Thus a minimum number of persons
have to be kept on a permanent basis. These persons may be the
manager, production supervisor, accounts clerk or a security
guard, etc. The number of such regular employees varies from one
unit to another depending on its requirements. We observed that
as far as our sample units are concerned employment of regular
persons was quite low since around one-third of the total units
were employing around 2 persons each and another 47 per cent
between 3-6 persons. Thus only a small proportion of units were
employing regular staff in excess of 6 per unit. The overall
average employment of persons on a permanent basis was 4. In the
case of Saharanpur the average was below two persons which was the
lowest whereas in Moradabad, which had the highest per unit
employment, the average was around 5. (Table 4.7).

The salaries of the permanent staff varied in accordance with
the nature of their work. Thus a night watchman may be earning

around Rs.500 - 600 per month while those placed in a managerial position may be getting between Rs.1000 - 1500 per month.

The main dependence of the khandsari units is on the casual workers who are employed on a daily wages basis during the crushing season. There is a considerable variation between the units as far as the total strength of casual workers is concerned. Saharanpur and Muzaffarnagar for instance had smaller sized units from the point of view of capital employed and cane crushed. They therefore, also have a lower level of employment as well on a daily wages basis. Over 75 per cent of the units from both the districts have an employment size much below 100. The employment in the remaining units range between 101 - 150 persons. As a result the average employment per unit worked out to be around 49 and 69 for Saharanpur and Muzaffarnagar respectively.

The other three districts had a relatively much higher size of employment. In the case of Meerut nearly half the units are employing over 150 persons. In fact it has only one unit (5.88%) where the number of casual workers is less than 100. Even in Moradabad nearly one-third of its units had an employment of over 150 persons in the category of casual workers. This percentage was slightly low (15%) in the case of Bijnor even though it had two units where employment was in excess of 200 persons.

Taking the districts together the average employment per unit was of the order of 104 persons. Meerut, of course, had the highest per unit employment of 153 workers followed by Moradabad (134 workers) (Table 4.7).

As far as casual labour is concerned its availability in terms of local labour is a problem for the khandsari units. The ongoing wages of around Rs.25 per day involve a working period of around 10 hours. So local labour is not very easily available since many feel that they can earn more than or at least as much in any other activity than what a khandsari unit offers by putting in lesser hours of work. They feel that even as a rickshaw puller they can earn more. Moreover, a job in a brick kiln and some other activities is much more lucrative. Thus the khandsari units have to rely mainly on labour from outside the region. The casual labour is provided through contractors who are bringing labourers mainly from Eastern U.P. and Bihar. The entrepreneurs generally bear their railway fares so as to ensure that labour reaches the unit on time and in the required numbers. The advantage with such non-local labour is that they prepare kuchha houses within the premises of the unit and stay there throughout the crushing season. Thus the unit is never faced with the problem of labour shortage even during adverse weather conditions. Since they are staying within the unit itself they are kept engaged in work more easily as compared to the local labourers who can prove to be more troublesome by indulging in local politics, besides being non regular.

When we look at the type of employment in our selected units in different districts we find that less than one-=fourth of the total units are employing only local labour while over 70 per cent units depend on local as well as non-local labour. The units of Bijnor and Moradabad alone are employing only local labourers in a

sizeable proportion with around 43 and 34 per cent units respectively from each of the above mentioned districts having only local labour employed on a daily wages basis. On the other hand around 35 per cent units of Meerut depend solely on non-local labour. Saharanpur is the only other district which has 10 per cent units where all the casual labour is non-local. Thus the units by and large have a high proportion of mixed labour which is inclusive of local and non-local persons. There are, of course, wide variations among the proportion of the five districts depending upon their employment shares of only local or only non-local labour. Thus in Muzaffarnagar the proportion of mixed labour is the highest with 90 per cent while it is lowest in the case of Bijnor (56.76%). The overall percentage for all the districts taken together works out to be 70.63 per cent (Table 4.8).

As far as daily wages of the casual workers is concerned it is just short of Rs.25 for all the districts taken together. Nearly half the units are paying below Rs.25 per day while the remaining units are paying above Rs.25. However, variation between the actual wages is not very much since nowhere are the daily wages below Rs.22 whereas the highest daily wages are around Rs.28. There are, of course, variations between the districts. In Moradabad, for instance, the average daily wage is Rs.22.28 per unit because 87.5 per cent units have a wage rate below Rs.25. On the contrary Muzaffarnagar and Saharanpur have the highest average wage rate of around Rs.26.5 and Rs.26 respectively (Table 4.8).

Expenditure Pattern of the Khandsari Units

In order to find out the cost of production it is essential to look into the pattern of expenditure incurred by the units on different inputs as well as other items of expenditure. The questionnaire, therefore, had a section on this aspect so that details could be collected regarding the pattern of expenditure. For the purpose of our analysis we have taken the broad items raw materials, fuel inputs, wages and salaries, rent, depriciation, miscellaneous expenses and taxes. The raw material inputs have been sub-divided into four categories, viz. sugarcane, sulphur, lime and other inputs. Likewise, the fuel inputs comprise of electricity, diesel, bagasse purchased from outside, firewood and coal. The analysis has been carried out on the basis of the percentage share of each item of expenditure (Table 4.9).

The main input, obviously, is sugarcane itself so it obviously accounts for the highest share in total expenditure. The overall share of sugarcane is around 70 per cent for all the districts taken together. There are some differences between the districts. The share in the case of Bijnor is the lowest (68.81%) while that of Muzaffarnagar is the highest (72.55%). The other raw material inputs account for around one per cent each. Thus the item raw material taken together accounts for around 74.5 per cent of the total cost. The districts of Saharanpur and Muzaffarnagar have mainly non-sulphitation units so they have either no expenditure or negligible expenditure on sulphur and lime.

The most important fuel input is diesel. In the state the power supply is inadequate particularly so in the rural areas. In

order to make up for the rather erratic power supply all the units
have their own standby arrangements. They all have private
generating sets to ensure that the production process is not
interrupted unduly. The units which have the smaller size crusher
(11" x 14") generally have generating sets having a 200 - 250
horse power capacity. The units having bigger crushers keep a
bigger sized generator having a capacity of 250 - 300 horse power.
Diesel, therefore, accounts for nearly 3 per cent of the total
expenditure in the five districts taken together. This percentage
is much higher (4.75) in the case of Meerut where the dependence
on electricity is negligible. Meerut as we know is the most
industrialised district among our selected districts and so the
demand of power in the industrial sector is very high. In Bijnor,
on the other hand the expenditure on diesel is not even two per
cent. This is so because its expenditure on electricity is the
highest (2.82%). Apparently, the power situation is not very
acute in the case of Bijnor. The only other district having an
expenditure of over 2 per cent on electricity is Moradabad. Both
firewood and coal have a very low share in total expenditure. If
we take all the items of fuel they account for around 6 per cent
on the whole with only slight variations among the districts.

The second most item of expenditure after raw materials is
wages and salaries which accounts for around 9 per cent share of
total expenditure. The expenditure on this head is relatively
higher in the case of Bijnor (10.98%) while the lowest share is
that of Saharanpur (8.73%).

Depreciation accounts for less than 2 per cent of the total expenditure while rent forms a negligible part of the total expenses.

Miscellaneous and other expenses forms yet another big item of expenditure. It includes a variety of things such as stationery, telephone charges, car expenses, travelling, auditors fees, postage, etc. These different items together account for around 7 per cent. There are considerable differences between the districts. Saharanpur is showing an expenditure of nearly 10 per cent while in Bijnor it is 6.43 per cent only.

Finally, taxes which comprise of the purchase tax on sugarcane, sales tax and the mandi tax constitutes just over 2 per cent of the total expenditure. The share in Saharanpur (3.10%) is the highest while that of Muzaffarnagar (1.91%) the lowest.

The per unit average expenditure worked out to Rs.45.90 lakhs for all the districts taken together. Meerut, by virtue of its large sized sulphitation units, had the highest per unit expenditure (Rs.64 lakhs) while it was only Rs.18.64 lakhs in the case of Saharanpur which has units of smaller size.

Table 4.1 : Distribution of Units by Size of Land and Building.

Size groups of Land and Building (Lakh Rs.)	Meerut	Moradabad	Muzaffar- nagar	Saharan- pur	Bijnor	All Districts
No Response	-	-	-	1 (5.00)	1 (2.70)	2 (1.59)
Below 1	-	-	6 (30.00)	14 (70.00)	-	20 (15.87)
1 - 2	1 (5.88)	20 (62.50)	10 (50.00)	5 (25.00)	24 (64.86)	60 (47.62)
2 - 4	7 (41.18)	9 (28.13)	3 (15.00)	-	10 (27.03)	29 (23.02)
4 - 6	6 (35.29)	3 (9.37)	1 (5.00)	-	2 (5.41)	12 (9.52)
Above 6	3 (17.65)	-	-	-	-	3 (2.38)
Total	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)
Average Value (Rs. Lakhs)	4.20	1.86	1.50	0.68	1.59	1.85

Note : Figures in brackets indicate the percentage to column total.

Table 4.2 : Distribution of Units by Size of Plant,
Machinery and Equipments

Size groups of Plant & Machinery (Lakh Rs.)	Meerut	Moradabad	Muzaffar- nagar	Saharan- pur	Bijnor	All Districts
Below 1	--	--	5 (25.00)	12 (60.00)	--	17 (13.49)
1 - 2	2 (11.76)	18 (56.25)	9 (45.00)	5 (25.00)	21 (56.76)	55 (43.65)
2 - 4	2 (11.76)	9 (28.13)	5 (25.00)	3 (15.00)	8 (21.62)	27 (21.43)
4 - 6	2 (11.76)	3 (9.37)	1 (5.00)	--	4 (10.81)	10 (7.94)
6 - 8	7 (41.18)	2 (6.25)	--	--	1 (2.70)	10 (7.94)
8 - 10	3 (17.65)	--	--	--	3 (8.11)	6 (4.76)
Above 10	1 (5.88)	--	--	--	--	1 (0.79)
Total	17 (100.0)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)
Average Value (Rs. lakhs)	5.89	2.35	1.66	0.96	2.53	2.54

Note : Figures in brackets indicate the percentages to column total.

Table 4.3 : Distribution of Units by Value of Fixed Capital.

Size groups of Fixed Capital (Lakh Rs.)	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Below 1	–	–	2 (10.00)	8 (40.00)	–	10 (7.94)
1 - 2	1 (5.88)	6 (18.75)	4 (20.00)	5 (25.00)	10 (27.03)	26 (20.63)
2 - 4	1 (5.88)	12 (37.50)	8 (40.00)	5 (25.00)	14 (37.83)	40 (31.75)
4 - 6	–	6 (18.75)	3 (15.00)	2 (10.00)	6 (16.22)	17 (13.49)
6 - 8	2 (11.76)	3 (9.37)	3 (15.00)	–	3 (8.11)	11 (8.73)
8 - 10	4 (23.53)	5 (15.63)	–	–	–	9 (7.14)
Above 10	9 (52.94)	–	–	–	4 (10.81)	13 (10.32)
Total	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)
Average Value (Rs. lakhs)	10.08	4.20	3.16	1.66	4.17	4.42

Note : Figures in brackets indicate the percentages to column total

Table 4.4: Distribution of units by Size of Working Capital

Size groups of Working Capital (Lakh Rs.)	Meerut	Moradabad	Muzaffar- nagar	Saharan- pur	Bijnor	All Districts
Below 1	-	-	2 (10.00)	5 (25.00)	-	7 (5.56)
1 - 2	8 (47.06)	17 (53.13)	11 (55.00)	11 (55.00)	14 (37.84)	61 (48.41)
2 - 4	1 (5.88)	8 (25.00)	7 (35..00)	4 (20.00)	14 (37.84)	34 (26.98)
4 - 6	1 (5.88)	7 (21.87)	-	-	6 (16.22)	14 (11.11)
6 - 8	4 (23.53)	-	-	-	1 (2.70)	5 (3.97)
Above 8	3 (17.65)	-	-	-	2 (5.40)	5 (3.97)
Total	17 (100.00)	32 (100..00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)
Average Value (Rs. lakhs)	4.11	2.44	1.62	1.49	2.77	2.48

Note : Figures in brackets indicate the percentage to column total.

Table 4.5 : Distribution of Units by Size of Productive Capital

Size of Product-ive capital (Lakh Rs.)	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Below 5	2 (11.76)	10 (31.25)	12 (60.00)	18 (90.00)	16 (43.24)	58 (46.04)
5 - 10	1 (5.88)	16 (50.00)	7 (35.00)	2 (10.00)	13 (35.14)	39 (30.95)
10 - 15	4 (23.53)	6 (18.75)	1 (5.00)	-	6 (16.22)	17 (13.49)
15 - 20	8 (47.06)	-	-	-	1 (2.70)	9 (7.14)
Above 20	2 (11.76)	-	-	-	1 (2.70)	3 (2.38)
Total	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)
Average Value (Rs. lakhs)	14.20	6.65	4.77	3.15	6.92	6.89

Note : Figures in brackets indicate the percentages to totals.

Table 4.6 : Value of Plant and Machinery, Fixed Capital and
Productive Capital per worker.

	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Value of Plant & Machinery per worker (Rs.)	3852.48	1747.45	2418.23	2251.87	2311.40	1983.00
Value of Fixed Capital per worker	6599.20	3128.45	4605.36	3913.57	3807.98	4226.51
Productive Capital per worker	9289.54	4946.20	6965.96	7421.51	6314.75	6593.86

Table 4.7 :Distribution of Units by Size of Employment.

Size of Employment	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
REegular						
Upto 2	5 (29.42)	3 (9.38)	11 (55.00)	17 (85.00)	10 (27.03)	46 (36.50)
3 - 6	10 (58.82)	21 (65.62)	8 (40.00)	3 (15.00)	17 (5.95)	59 (46.83)
Above 6	2 (11.6)	8 (25.00)	1 (5.00)	--	10 (27.03)	21 (16.67)
Average Employment	4.29	5.19	2.95	1.75	4.78	4.05
Casual Labour						
Below 100	1 (5.88)	8 (25.00)	15 (75.00)	16 (80.00)	18 (48.65)	58 (46.03)
101 - 150	8 (47.06)	14 (43.75)	5 (25.00)	4 (20.00)	13 (35.14)	44 (34.92)
151 - 200	6 (35.29)	4 (12.50)	--	-	4 (10.81)	14 (11.11)
Above 200	2 (11.76)	6 (18.75)	-	-	2 (5.40)	10 (7.94)
Average Employment of Casual Labourers	152.82	134.38	68.55	42.45	109.54	104.53

Note : Figures in brackets indicate the percentages to total.

Table 4.8 : Distribution of units by Rates of Daily Wages and Origin of
Casual Labour.

Daily Wage Groups (Rs.)	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Below 25	5 (29.41)	28 (87.50)	8 (40.00)	4 (20.00)	17 (45.95)	62 (49.21)
Above 25	12 (70.59)	4 (12.50)	12 (60.00)	16 (80.00)	20 (54.05)	64 (50.79)
Average Daily Wages	25.64	22.28	26.55	26.05	24.38	24.63
Origin of Labour						
Only Local	-	10 (31.25)	2 (10.00)	1 (5.00)	16 (43.24)	29 (23.02)
Non-Local	6 (35.29)	-	-	2 (10.00)	-	8 (6.35)
Both	11 (64.71)	22 (68.75)	18 (90.00)	17 (85.00)	21 (56.76)	89 (70.63)
Total	17 (100.00)	32 (100.00)	20 (100.00)	20 (100.00)	37 (100.00)	126 (100.00)

Note : Figures in brackets indicate the percentage to total.

Table 4.9 : Percent Share of Expenditure by Different Heads.

Head of Expenditure	Meerut	Moradabad	Muzaffar- nagar	Saharan- pur	Bijnor	All Districts
Raw Material						
Sugar cane	69.36	70.58	72.55	69.95	68.81	70.02
Sulphur	1.44	1.47	0.29	0.00	1.64	1.26
Lime	1.08	1.21	0.28	0.00	1.46	1.05
Others	1.27	0.78	2.47	2.97	0.67	1.22
Fuel Inputs						
Electricity	0.06	2.27	1.48	0.58	2.82	1.81
Diesel	4.75	2.79	2.70	2.78	1.93	2.87
Bagasse Purchased	0.97	0.76	1.76	0.79	0.78	0.95
Firewood	0.75	0.34	0.03	0.21	0.10	0.29
Coal	0.34	0.20	0.00	0.00	0.08	0.15
Wages and salaries	9.17	7.36	7.43	8.73	10.98	8.96
Rent	0.04	0.11	0.08	0.19	0.07	0.08
Depreciation	1.11	2.33	1.20	0.87	2.23	1.82
Miscellaneous and Other Expenses	7.00	7.30	7.82	9.83	6.43	7.20
Taxes	2.66	2.50	1.91	3.10	2.00	2.32
Total	100.00	100.00	100.00	100.00	100.00	100.00
Average Expenditure per Unit (Rs.Lakhs)	64.05	51.16	41.39	18.64	50.19	45.90

Chapter V

PRODUCTION, MARKETING ARRANGEMENTS AND PRICES OF
KHANDSARI PRODUCTS

In an earler chapter we had dealt with the quantum of sugarcane crushed in the khandsari units of our selected districts. Meerut had emerged as the district with relatively large sized units and the average cane crushed per unit had been estimated to be around 144 thousand quintals. Saharanpur on the other hand had much smaller units with an average of 49 thousand quintals of sugarcane crushed per unit. The total quantity of sugarcane crushed in all our sample units taken together had worked out to be 141.30 lakh quintals during 1989-90. We had, in the preceding chapter, also analysed the expenditure pattern of these units. We shall, in this chapter, deal with the production, marketing and prices of the different products produced by the khandsari units.

The main products of the khandsari units are khandsari, pure gur, molasses and badda gur. Badda gur, as already indicated earlier, is molasses solidified into lumps through a simple process. There is also a common practice to sell Raab as rab itself.

The units have been classified into four size groups on the basis of their value of total production. The lowest size group consists of units whose value of production is below Rs.25 lakhs. Only around one-fifth of the total units were in this category and they were mainly from Saharanpur. Three-fourths of the units of

Saharanpur had a production below Rs.25 lakhs. The next size group consisted of units where the value of total production ranged between Rs.25 - 50 lakhs. Slightly over one-third of the total units were in this category. Moradabad, Muzaffarnagar and Bijnor had an almost equal proportion of units in this size group. Thus if we take into account the units having a value of production below Rs.50 lakhs it represents all the units of Saharanpur, 70 per cent units of Muzaffarnagar and around 57 per cent units of Bijnor.

The third group, having a production level ranging between Rs.50 to 75 lakhs had in all around one-fourth of the total units. It was mainly Meerut, Moradabad and Bijnor which represented the group. Muzaffarnagar also constituted a small proportion. The highest size group represented units where the value of total production exceeded Rs.75 lakhs. The proportion of units in this category was obviously the lowest. Among the district it was Meerut which had the highest representation. Thus if we take the larger sized units having a value of production in excess of Rs.50 lakhs it represents around 82 per cent units of Meerut, 54 per cent units of Moradabad and roughly 43 per cent units of Bijnor.

The average value of output per unit for the districts taken together was around Rs.48.63 lakhs. Saharanpur was much below this average. In fact, the per unit average value was not een half this amount. The highest value of total output per unit was in the case of Meerut (Rs.72.24 lakhs). There was not much difference between Moradabad and Bijnor. Muzaffarnagar was the

only other district besides Saharanpur with a lower average value
than the all district average (Table 5.1).

    Looking at the production of differnt products in quantity
terms for each of the products separately, we find a wide
variation.   We have, therefore, arranged them in different size
groups.   Saharanpur being a district with small sized units, had
nearly 58 per cent units in which less than two thousand quintals
of khandsari was produced in 1989-90.   The remaining units
produced between 2-5 thousand quintals. The only other district
which had some units in the lowest size group was Muzaffarnagar.
This size group on the whole accounted for barely 11.4 per cent of
the total units. The next size group (2 - 5 thousand quintals)
had the maximum number of units (31.58%). Among the districts
Muzaffarnagar was the most important since 56 per cent of its
units were in this group alone. The next higher size group
constituted of units whose khandsari production was above 5
thousand but below 8 thousand quintals. While on the whole around
one-fourth of the total units were found in this category, among
the individual districts the highest share was that of Bijnor
which had a total of 46.67 per cent units with this size of
khandsari production. Very nearly one-fourth of the total units
represented the size group 8 - 12 thousand quintals and Moradabad
with 43.73 per cent units was the most dominant district of this
size group. Meerut,as we have already seen, has the most efficient
as well as larger sized units and so their corresponding levels of
output are also high. Thus, we find 35 per cent units in this
size group followed by an equal share of units in the highest size
group (above 12 thousand quintals).

The average khandsari production per unit was just short of 6
thousand quintals. Only Meerut and Moradabad have a better per
unit average (Table 5.2).

Pure gur was being produced by only 13 units. There were 7
from Bijnor, 4 from Muzaffarnagar and a single unit each in
Saharanpur and Moradabad. In fact these units producing pure gur
were not producing khandsari at all. During the last crushing
season they produced 87.15 thousand quintals of gur valued at
Rs.316.79 lakhs. Similarly 33 units sold raab as raab. Its
quantity was 149.15 thousand quintals valued at Rs.221.55 lakhs.

Khandsari molasses is sold in two forms. In the first
instance it is sold as molasses. However, its transportation is
inconvenient. Thus the other method is to solidify the molasses
and convert it into what is locally known as 'badda gur'. No
technique is required in this conversion. The molasses is heated
and then spread on the ground where a very thin layer of saw-dust
is pre-laid. As soon as the molasses starts cooling it is
collected and put in bucket shaped moulds and so it takes that
shape on solidifying. In the case of Meerut no unit reported to
have made badda gur. On the other hand no unit from Saharanpur
sold molasses while only one did so from Muzaffarnagar. They all
converted molasses to badda gur before sale. However, there were
also quite a few units which sold both khandsari molasses and
badda gur.

Only 64 out of the 126 units sold khandsari molasses without
converting it into badda gur. This included all the 17 units of

Meerut. In the case of Bijnor 17 out of 37 and from Moradabad 29 out of 32 units sold khandsari molasses. While not a single unit from Saharanpur sold molasses the number in the case of Muzaffarnagar was only one. As the units of Meerut are big the quantity of molasses produced was also high. Thus, around 82 per cent units produced over 6 thousand quintals each. In the other districts the level of molasses production was relatively lower. In Moradabad, for instance, nearly 75 per cent units were producing below 6 thousand quintals each while the percentage for Bijnor was as high as 47 per cent for units which produced less than 2 thousand quintals of khandsari molasses. On the whole the average quantity of molasses produced per unit was around 2.44 thousand quintals. This average for Meerut was around 7.42 thousand quintals while that for Moradabad 4.24 thousand quintals. In the case of Bijnor it was around a thousand quintals per unit (Table 5.3).

Similarly there were 67 units which produced badda gur. Their number was highest in the case of Bijnor (21 units) followed by Saharanpur (19 units) and Muzaffarnagar (15 units). Badda gur was not being produced in very high quantities since over 67 per cent units were producing less than 4 thousand quintals each. Meerut, as already indicated did not have any unit which produced badda gur. The overall average production per unit was around 1.85 thousand quintals. The district with the highest average production per unit was Muzaffarnagar (4.18 thousand quintals). Saharanpur and Bijnor had a similar production of around 2.5 thousand quintals each while the per unit production in Moradabad

was rather low (0.36 thousand quintals) (Table 5.4).

There were a few pure gur producing units which produced neither molasses nor bada gur.

Productive Efficiency of the Units

Having had some idea regarding the overall production as well as the production of different products let us now turn out attention towards the productive efficiency of these units measured in terms of cost of production of khandsari per quintals, value added per worker and value of output per unit of fixed and productive capital.

When we look at the cost of production of khandsari it becomes quite clear that the units of Meerut are far more efficient as compared to the units of the remaining districts. Although the cost of production per quintal is the lowest in Moradabad (Rs.703) but it is only marginally lower than Meerut. On the other hand Meerut has a much higher average selling price of Rs.696 per quintal as against an average selling price of Rs.669 in the case of Moradabad. The only other district with a cost of production below Rs.800 is Bijnor (Rs.778 per quintal). The cost of production per quintal in districts of Saharanpur and Muzaffarnagar are Rs.936 and Rs.1042 per quintal respectively whereas the average selling prices in those districts were Rs.689 and Rs.700 per quintal respectively. This clearly shows that although Meerut and Moradabad may be relatively efficient, yet even they have a cost of production per unit higher than their average selling price.

The fact remains that they are surviving primarily on account of their sale of by-products mainly molasses and badda gur. Both these products fetch a high price and so on the whole the units end up with a profit despite the adverse conditions regarding the cost of production of khandsari which is the main product. The average cost of production for khandsari for all the units taken together was estimated to be around Rs.776 per quintal against its average selling price of Rs.679 per quintal. Thus the selling price was nearly Rs.100 below what the cost of production is.

If we look at the figures of value added per worker we find that Saharanpur is best placed with a value added per worker of around Rs.15200. Meerut is second with Rs.13200 while Muzaffarnagar is placed third with Rs.12300. The figuress for both Bijnor and Moradabad is below Rs.10.000. The figures for Saharanpur could be slightly misleading since the average employment in Saharanpur is very low and this could have inflated the value added per worker. Moreover, the prices of molasses quoted by the units of Meerut do not seem very realistic as the average price is only Rs.53 per quintal. As against this the average price per quintal of badda gur is as high as Rs.252 per quintal. So obviously the value of total production in Meerut is possibly an underestimate. However, these are the figures indicated in the balance sheets and so they had to be taken as they are. The figures of value added per worker are not very high as compared to some of the modern industries. In fact, they are much lower even in comparison of the sugar industry. However, what is encouraging is that over the years they have increased.

For instance, if we take the value added per worker in 1985-86 as given in the Annual Survey of Industries, U.P., the average for U.P. as a whole was Rs.3551. As against this the value added per worker for all the units taken together in our sample the value added is Rs.10,691 which is nearly three times as high as that obtained during 1985-86. Similarly, we find a similar situation in the case of all the five districts selected by us for the study.

Looking at the value of output per worker we find that Muzaffarnagar has the highest value of around Rs.62,300 per worker. All the other districts have a value above Rs.40 thousands but below Rs.50 thousands with slight variations among the districts (Table 5.5).

When we analysed the efficiency of capital in terms of output per unit of fixed and productive capital we found that in the case of fixed capital Meerut had the lowest figure. It was the second lowest after Saharanpur in the case of productive capital as well. However, we will have to keep in mind the fact that since the units of Meerut are relatively new, their investments in plant and machinery and even land etc. are much higher. This partly accounts for the low value of output per unit of fixed and productive capital employed in Meerut. It is an accepted fact that in the initial period returns on investment are generally low. Muzaffarnagar was the district having the highest value of output for both fixed and productive capital (Table 5.5).

The recovery rates of khandsari and khandsari molasses had been provided by the individual units. However, we thought it appropriate to estimate the same even on the basis of their figures of total sugarcane crushed and actual production in order to cross-check the estimates which had been provided by the units. Our estimated figures of khandsari and molasses recovery rates are shown in Table 5.7. In the case of khandsari there is only a slight difference between the recovery rates estimated by us and those provided by the units themselves. Our recovery rates are marginally higher and so our recovery for all the districts taken together was 5.61 per cent while according to the estimates provided to us the recovery rate worked out to be 5.33 per cent. Meerut, of course, had the highest recovery rate as it had sulphitation units while Saharanpur was the district with non-sulphitation units and so its recovery rate was the lowest.

In the case of Molasses there are variations between our estimates and those provided by the individual units. Our recovery rates are much higher in the case of Meerut and Saharanpur where our estimated recovery was 5.14 and 5.69 per cent respectively as indicated by the units of Meerut and Saharanpur. But there was not much difference in the average recovery of the five districts taken together as our estimates were lower in the case of Moradabad and Bijnor.

Marketing of the Products

It is seen that the various products of the khandsari units are sold both within the state as well as outside. The other

states to which these products are sold not only include the nearby states of Haryana and Punjab but also to the states like West Bengal, Gujarat and Maharashtra and Jammu & Kashmir which are far off.

In the entire sample only one unit of Moradabad was selling its entire khandsari produced within Uttar Pradesh. As many as 71 per cent units are selling khandsari both in U.P. as well as outside. The remaining 28 per cent units are selling their khandsari outside the state.

In the case of pure gur there were 13 units manufacturing pure gur. As many as 12 of these were selling their produce outside the state while the remaining unit was selling both within and outside the state.

Only a very low proportion of the raab sale was conducted in the state only (12.5%) while over two-thirds found its way to the other states.

The highest percentage of sale outside U.P. was found in the case of badda gur since nearly 93.5 per cent units sold badda gur in states other than Uttar Pradesh. The rest was sold both within and outside U.P.

The only product where bulk of the sale is only within the state is molasses (61%). Only around one-third is sold totally outside the state.

We, therefore, observe that sale of different products, with the exception of molasses, is outside Uttar Pradesh. This is

mainly so since the units have to pay a sales tax as well as mandi tax on the sales within the state. This is avoided in the case of sales to other states.

Out of the total molasses produced nearly 72.5 per cent of it was sold within the state. The next most important state was West Bengal where nearly 21 per cent of the sale was diverted to. The other states had a marginal share.

The picture was reversed in the case of badda gur since less than 2.5 per cent was sold within U.P. Among the states outside U.P. the hitghest share of badda gur found its way to Gujarat which incidentelly is a dry state but liquor is being made in the state illegally. A few years back a big consignment of badda gur was confiscated by the authorities in Gujarat and since then the standard practice adopted has been that all gunny bags with badda gur are stamped "Animal Feed" before they leave espacially for Gujarat and for most other states.

Muzaffarnagar is a big mandi for khandsari and other products. The team visiting the district also learnt that khandsari is also being sent to even Pakistan through Punjab.

Selling Arrangements for Different Products

Each unit has its own selling arrangements for its products. The main sources are through the wholesalers and commission agents. Some sale is through retailers and sale is sometimes directly made even to individual consumers. However, direct sale is very negligible.

In the case of khandsari nearly three-fourths is sold through the commission agents, while almost the entire amount left over is sold to the wholesalers. A fraction of it (0.5%) was sold retailers.

The entire amount of pure gur was sold through the commission agents.

The sale of raab, however, was almost evenly distributed between the wholesalers and commission agents although the share of the latter was higher. There were differences between individual districts. Thus, Meerut sold 90 per cent raab through the wholesalers while in Bijnor nearly 70 per cent was sold through the commission agents.

The commission agents had the lions share in the case of badda gur and they accounted for over 87 per cent of the total sale. In the case of molasses, however, their share was around 54.5 per cent.

It is, therefore, seen that where sale outside the state is concerned, the sales are generally handled by the commission atgents while sales within the state through the wholesalers (Table 5.10).

We have also given a frequency distribution of the sales of different products on a unitwise basis as well (Table 5.11).

Prices of Different Products

The prices of the different products at which sales were made during 1989-90 varied between individual units within the districts and also among the districts. The average khandsari price was the highest in Muzaffarnagar (Rs.700 per quintal)

closely followed by Meerut (Rs.696 per quintal). In the remaining districts the prices were lower. The overall average selling price was Rs.677.6 per quintal. The maximum selling price for any individual unit was Rs.765 per quintal in the case of Meerut while the lowest price at which khandsari was sold was Rs.517 per quintal in the case of a unit located in Moradabad.

In the case of gur the overall average price was around Rs.367 per quintal. The highest price was Rs.440 in Moradabad while the lowest average price was Rs.350 in Bijnor.

The price variation is rather striking in the case of raab. A unit from Meerut has shown its raab price at Rs.24 per quintal. It is very strange as to why the sale was made on such uneconomic prices when the lowest rate for khandsari in Meerut itself was Rs.615 per quintal. As against this the highest price which raab fetched was Rs.383 in the case of Bijnor which too is lower than the lowest khandsari price of Rs.517 per quintal in that district. The overall average price of raab was Rs. 181.7 per quintal.

There are striking variations even in the case of the sale prices of khandsari molasses. There are instances of units selling both molasses as well as badda gur and the price of molasses was much lower. It is quite inconcievable as to why priate enterprise, where profit is the main motive, would sell molasses at Rs.40 per quintal whereas it is getting a much higher price for badda gur. That too when the conversion of molasses into badda gur does not involve much cost. In our sample we have a unit from Meerut which sold molasses at the rate of Rs.33 per

quintal whereas a unit of Moradabad has quoted its selling price
of molasses at Rs.250 per quintal. As a result of these erratic
price variations the overall average selling price of molasses was
Rs.68 per quintal. Our own findings were that these prices do
change but rarely do they go below Rs.100 per quintal.

Badda gur, likewise, was not without variations in terms of
its selling price. The lowest price stated by a unit was Rs.80
per quintal in Bijnor while the highest price was that of a unit
in Saharanpur (Rs.325 per quintal). The average price for all
units taken together was just below Rs. 200 (Table 5.12).

To have a better idea regarding prices of sugarcane and the
selling prices of khandsari, molasses and badda gur we have given
separate tables (Tables 5.13 to 5.16) which gives frequency
distribution of units according to different price ranges.

It, therefore, appears that prices stated in the balance
sheets of the khandsari units, particularly for molasses and badda
gur are not the actual prices received by the units in question
for a number of units. However, our analysis was constrained by
the fact that as these were prices provided in the balance sheets
of the units they had to be taken as such.

Table 5.1 : Distribution of Units by Value of Total Production.

District	Total Units	Value of Total Output (Rs.Lakhs)				Average Value per unit (Rs. Lakhs)
		Below 25	25-50	50-75	Above 75	
Meerut	17 (100.00)	—	3 (17.65)	6 (35.29)	8 (47.06)	72.24
Moradabad	32 (100.00)	1 (3.12)	13 (40.63)	12 (37.50)	6 (18.75)	54.41
Muzaffar-nagar	20 (100.00)	6 (30.00)	8 (40.00)	3 (15.00)	3 (15.00)	42.72
Saharan-pur	20 (100.00)	15 (75.00)	5 (25.00)	—	—	21.02
Bijnor	37 (100.00)	5 (13.51)	16 (43.25)	11 (29.73)	5 (13.51)	50.89
Total Units	126 (100.00)	27 (21.43)	45 (35.71)	32 (25.40)	2 (17.46)	48.63

Note : Figures in brackets indicate the percentage to total.

Table 5.2 : Distribution of units by Quantum of Khandsari Produced

Districts	Quantum of Khandsari Produced (Quantity in '000 qtls)					Total	Average Quantity
	Less than 2	2 - 5	5 - 8	8 - 12	12 +		
Meerut	–	1 (5.88)	4 (23.53)	6 (35.29)	6 (35.29)	17 (100.00)	9078.06
Moradabad	–	9 (28.12)	9 (28.12)	14 (43.76)	–	32 (100.00)	7273.10
Muzaffar-nagar	2 (12.50)	9 (56.25)	2 (12.50)	2 (12.50)	1 (6.25)	16 (100.00)	3971.85
Saharanpur	11 (57.89)	8 (42.11)	–	–	–	19 (100.00)	2023.20
Bijnor	–	9 (30.00)	14 (46.67)	5 (16.67)	2 (6.66)	30 (100.00)	6443.72
Total units	13 (11.40)	36 (31.58)	29 (25.44)	27 (23.69)	9 (7.89)	114 (100.00)	5917.25

*In district Muzaffarnagar 4 units produce only pure gur.
 In district Saharanpur 1 unit produced only pure gur.
 In district Bijnor 7 units produce only pure gur.

Note : Figures in brackets indicate the percentage to total.

Table 5.3 : Distribution of units by quantum of Molasses Produced.

Districts	Quantum of Molasses Produced (Quantity in '000 qtls)					Total	All Units	Average Quantity (qtls)
	Less than 2	2 - 4	4 - 6	6 - 8	8 +			
Meerut	1 (5.88)	—	2 (11.76)	7 (41.18)	7 (41.18)	17 (100.00)	17	7423.64
Moradabad	4 (13.79)	8 (27.59)	9 (31.03)	6 (20.69)	2 (6.90)	29 (100.00)	32	4244.28
Muzaffarnagar	—	—	—	—	1 (100.00)	1 (100.00)	20	405.40
Saharanpur	—	—	—	—	—	—	20	—
Bijnor	8 (47.06)	1 (5.88)	6 (35.30)	2 (11.76)	—	17 (100.00)	37	1008.48
Total Units	13 (20.31)	9 (14.06)	17 (26.56)	15 (23.44)	10 (15.63)	64* (100.00)	126	2440.00

*12 Units are neither producing molasses nor khandsari while remaining units, including some units whih are producing molasses, are also producing badda gur.

Note : Figures in brackets indicate the percentage to total.

Table 5.4 : Distribution of Units by Quantum of Badda Gur Produced.

Districts	Quantum of Badda Gur Produced (Quantity in '000 qtls)					Total	All Units	Average Quantity (qtls)
	Less than 2	2 - 4	4 - 6	6 - 8	8 +			
Meerut	-	-	-	-	-	-	17	-
Moradabad	5 (83.33)	-	1 (16.67)	-	-	6 (100.00)	32	360.63
Muzaffarnagar	2 (13.33)	1 (6.67)	6 (40.00)	4 (26.67)	2 (13.33)	15 (100.00)	20	4182.65
Saharanpur	7 (36.85)	10 (52.63)	1 (5.26)	1 (5.26)	-	19 (100.00)	20	2513.75
Bijnor	6 (28.57)	7 (33.33)	4 (19.05)	3 (14.29)	1 (4.76)	21 (100.00)	37	2380.16
Total Units	20 (32.79)	18 (29.51)	12 (19.67)	8 (13.12)	3 (4.91)	61 (100.00)	126	1853.44

Table 5.5 : Some Indicators of Productive Efficiency.

Districts	Cost of production of khand-sari per qtl (Rs.)	Per Worker		Valaue of output	
		Value added	Output	Per Unit of fixed capital	Per Unit of productive capital
Meerut	705.59	13268.13	47271.75	7.16	5.09
Moradabad	703.35	8795.87	40292.07	12.88	8.15
Muzaffarnagar	1042.05	12295.73	62312.44	13.52	8.94
Saharanpur	938.03	15202.54	49526.73	12.65	4.52
Bijnor	778.29	9564.50	46457.68	12.20	7.36
Total	775.70	10691.84	46453.53	11.00	7.05

Table 5.6 : Relationship Between Total Cane Crushed and Different
Sugarcane Products Manufactured.

(in qtls)

Districts	Sugarcane Crushed	Khandsari produced	Pure Gur	Raab Sold as Raab	Badda Gur	Molasses
Meerut	2455000	154327	–	19010	–	126202
Moradabad	4048602	232742	3155	42904	11540	135817
Muzaffarnagar	2013634	79437	29025	7749	79453	8108
Saharanpur	979000	40464	4362	–	50275	--
Bijnor	4632190	238603	50613	79486	88066	52614
Total	14128426	745573	87155	149149	229334	322741

Table 5.7 : Recovery Rates of Different Products
(Per cent)

Districts	Khandsari	Pure Gur	Molasses
Meerut	6.29	–	5.14
Moradabad	5.80	9.44	3.70
Muzaffarnagar	4.56	10.70	5.48
Saharanpur	4.31	10.90	5.89
Bijnor	5.77	10.19	3.61
All Districts	5.61	10.36	4.33

Table 5.8 : Distribution of Units by Area of Sale.

Districts	Khandsari			Pure Gur			Raab		
	U.P	Outside	Both	U.P.	Outside	Both	U.P.	Outside	Both
Meerut	–	1 (5.88)	16 (94.12)	–	–	–	2 (100.0)	–	–
Moradabad*	1 (3.12)	--	31 (96.88)	–	–	1 (100.0)	–	7 (63.64)	4 (36.36)
Muzaffar-nagar	–	12 (75.00)	4 (25.00)	–	4 (100.00)	–	–	–	–
Saharanpur	–	9 (47.37)	10 (52.63)	–	1 (100.00)	–	–	–	–
Bijnor	–	10 (33.33)	20 (66.67)	–	7 (100.00)	–	2 (10.53)	15 (78.94)	2 (10.53)
Total	1 (0.88)	32 (28.07)	81 (71.05)	–	12 (92.31)	1 (.69)	4 (12.50)	23 (68.5)	6 (18.75)

Table 5.8 (contd....)

Districts	Badd Gur			Molasses		
	U.P.	Outside	Both	U.P.	Outside	Both
Meerut	–	–	–	13 (76.47)	3 (17.65)	1 (5.88)
Moradabad*	–	6 (100.0)	–	20 (68.97)	8 (27.59)	1 (3.44)
Muzaffar-nagar	–	16 (100.0)	–	–	1 (100.0)	–
Saharanpur	–	16 (84.21)	3 (15.79)	–	–	–
Bijnor	–	20 (95.24)	1 (4.76)	6 (35.29)	10 (58.83)	1 (5.88)
Total	–	58 (93.55)	4 (6.45)	39 (60.94)	22 (34.38)	3 (4.68)

*In district Moradabad one unit has two crushers
and it produced khandsari and pure gur both.

Table 5.9 : Sale of Molasses and Badda Gur by Destination

(sale in qtls)

Districts	Total sale	Place of sale				
		Uttar Pradesh	Gujarat	Rajasthan	Punjab	Maharashtra
Meerut						
Molasses	124581.00 (100.00)	103590.00 (83.15)	–	2473.00 (1.99)	1435.00 (1.15)	–
Badda Gur	–	–	–			–
Moradabad						
Molasses	13376.00 (100.00)	93837.00 (70.15)	–	–	–	–
Badda Gur	11540.00 (100.00)	–	7992.00 (69.25)	–	–	2228.00 (19.30)
Muzaffarnagar						
Molasses	8108.00 (100.00)	–	–	–	–	–
Badda Gur	90857.00 (100.00)	–	23484.65 (25.85)	24481.00 (26.95)	23139.00 (25.46)	–
Saharanpur						
Molasses	–	–	–	–	–	–
Badda Gur	51342.00 (100.00)	3068.00 (5.99)	18154.00 (33.36)	11323.00 (22.05)	15208.00 (29.62)	–
Bijnor						
Molasses	44116.00 (100.00)	27555.00 (62.46)	6553.00 (14.88)	1633.00 (3.70)	814.00 (1.85)	1747.00 (3.96)
Badda Gur	90946.00 (100.00)	2768.00 (3.05)	33946.00 (37.33)	2773.00 (3.05)	17210.00 (18.92)	14092.00 (15.49)
All Districts						
Molasses	310566.00 (100.00)	224982.00 (72.44)	6563.00 (2.11)	4106.00 (1.32)	2249.00 (0.73)	1747.00 (0.56)
Badda Gur	244685.00 (100.00)	5836.00 (2.38)	83576.65 (34.16)	38577.00 (15.76)	55557.00 (22.71)	16320.00 (6.67)

Table 5.9 (contd....)

Districts	Place of Sale			
	West Bengal	Jammu & Kashmir	Himachel Pradesh	Bihar

Meerut

Molasses	12136.00 (9.74)	2473.00 (1.99)	2474.00 (1.99)	—
Badda Gur	—	—	—	—

Moradabad

Molasses	39124.00 (29.25)	—	—	800.00 (0.60)
Badda Gur	1320.00 (11.45)	—	—	—

Muzaffarnagar

Molasses	8108.00 (100.00)	—	—	—
Badda Gur	13002.35 (14.31)	—	6750.00 (7.43)	—

Saharanpur

Molasses	—	—	—	—
Badda Gur	—	—	3589.00 (6.99)	

Bijnor

Molasses	5804.00 (13.15)	—	—	—
Badda Gur	20157.00 (22.16)	—	—	—

All Districts

Molasses	65172.00 (20.98)	2473.00 (0.80)	2474.00 (0.80)	800.00 (0.26)
Badda Gur	34479.35 (14.07)	—	10339.00 (4.23)	—

Note : Figures in brackets indicate the
percentage to total.

Table 5.10 : Details of Sale Through Different Agencies.

(in Qtls)

Agency	Meerut	Moradabad	Muzaffar-nagar	Saharanpur	Bijnor	All Districts
Khandsari						
Wholesalers	35796 (21.38)	101558 (45.07)	15120 (19.23)	-	36960 (14.86)	189438 (24.83)
Commission Agents	131616 (78.62)	118917 (52.77)	63503 (80.77)	42662 (100.00)	211418 (84.89)	568116 (74.47)
Retailers	-	3378 (1.50)	-	-	407 (0.16)	3785 (0.50)
Direct Consumers*	3 (0.00)	1500 (0.66)	-	-	-	1503 (0.20)
Total	167415 (100.00)	225353 (100.00)	78623 (100.00)	42662 (100.00)	248785 (100.00)	762838 (100.00)
Raab						
Wholesalers	17110 (90.01)	12180 (28.85)	-	-	21811 (30.98)	51101 (45.78)
Commission Agents	1900 (9.99)	30032 (71.15)	-	-	28584 (69.02)	60516 (54.22)
Badda Gur						
Wholesalers	-	3177 (27.53)	18753 (20.64)	-	5223 (5.74)	27153 (11.10)
Commission Agents	-	8363 (72.47)	72104 (79.36)	51342 (100.0)	82946 (91.20)	214755 (87.77)
Retailers	-	-	-	-	2777 (3.06)	2777 (1.13)
Molasses						
Wholesalers	45911 (36.85)	85073 (63.82)	-	-	2448 (5.55)	133729 (43.06)
Commission Agents	78250 (62.81)	41481 (31.01)	8108 (100.00)	-	41668 (94.45)	169507 (54.58)
Direct Consumers	420 (0.34)	6910 (5.17)	-	-	-	7330 (2.36)
Pure Gur						
Wholesalers	-	-	-	-	-	-
Commission Agents	-	3155 (100.00)	27645 (100.00)	4362 (100.00)	50478 (100.00)	85640 (100.0)

*Gate sale or to individual purchases

Note : Figures in brackets indicate the percentage of total sales through different arrangements.

Table 5.11 : Distribution of Units by Sale through Different Agencies.

Agency	Meerut	Moradabad	Muzaffar-nagar	Saharan-pur	Bijnor	All Districts
Khandsari						
Wholesalers	5	18	2	–	5	30
Commission Agents	14	18	14	19	26	91
Retailers	–	2	–	–	1	3
Direct Consumers	1	2	–	–	–	3
Total	17	40	16	19	30	122
Raab						
Wholesalers	1	5	–	–	4	10
Commission Agents	1	8	–	–	15	24
Badda Gur						
Wholesalers	–	2	3	–	2	7
Commission Agents	–	4	13	19	18	54
Retailers	–	–	–	–	1	1
Molasses						
Wholesalers	6	17	–	–	2	25
Commission Agents	11	10	1	–	17	39
Consumers	1	3	–	–	–	4
Pura Gur						
Wholesalers	–	–	–	–	–	–
Commission Agents	–	1	4	1	7	13

Table 5.12 : Prices of Different Commodities During
1989-90 (Rs. per qtl).

Districts	Khandsari			Pure Gur			Raab		
	Maxi.	Min.	Average	Max.	Min.	Average	Max.	Min.	Average
Meerut	765.00	615.00	696.00	-	-	-	149.00	24.00	86.50
Moradabad	750.00	517.00	669.37	440.00	440.00	440.00	216.00	107.00	142.00
Muzaffar-nagar	750.00	610.00	700.31	400.00	350.00	372.50	-	-	-
Saharanpur	750.00	630.00	687.63	390.00	390.00	390.00	-	-	-
Bijnor	750.00	520.00	665.00	370.00	330.00	350.00	383.00	80.00	213.00
Total	765.00	517.00	679.58	440.00	330.00	366.92	383.00	24.00	180.68

Table 5.12 contd......

Districts	Badda Gur			Molasses		
	Max.	Min.	Average	Max.	Min.	Average
Meerut	-	-	-	74.00	33.00	53.00
Moradabad	276.00	85.00	156.00	251.00	30.00	69.00
Muzaffar-nagar	270.00	129.00	216.81	40.00	40.00	40.00
Saharanpur	325.00	175.00	252.25	-	-	-
Bijnor	213.00	80.00	147.00	234.00	20.00	84.00
Total	325.00	80.00	198.15	234.00	20.00	68.28

Table 5.13 : Distribution of units According to the
Price of Sugarcane.

Districts	Price of Sugarcane (Rs.per Qtls)					Average price	No. of Units
	25-26	27-28	29-30	31-32	33-35		
Meerut	–	1	4	8	4	31.24	17
Moradabad	3	16	10	1	2	27.41	32
Muzaffar-nagar	–	3	11	5	1	30.10	20
Saharanpur	2	7	8	3	--	28.70	20
Bijnor	6	21	6	2	2	28.13	37
All Districts	11	48	39	19	9	28.76	126

Table 5.14 : Distribution of Units According to the Sale
Price of Khandsari.

Districts	Selling Price of Khandsari (Rs.per Qtls)					Average Price	No. of Units Producing Khandsari
	Upto 550	551-600	601-650	651-700	701-765		
Meerut	–	–	2	8	7	696.00	17
Moradabad	1	–	13	10	8	669.37	32
Muzaffarnagar	–	–	1	9	6	700.31	16
Saharanpur	–	–	3	12	4	687.63	19
Bijnor	2	–	7	18	3	665.00	30
All Districts	3	–	26	57	28	679.58	114

Table 5.15 : Distribution of units According to Sale Price of Molasses.

Districts	Selling Price of Molasses (Rs.per Qtls)						Average Price	No. of Units producing Badda Gur
	Below 50	50-75	76-100	101-151	151-200	200+		
Meerut	4	13	-	-	-	-	53.00	17
Moradabad	7	13	6	2	-	1	69.00	29
Muzaffarnagar	1	-	-	-	-	-	40.00	1
Saharanpur	-	-	-	-	-	-	-	-
Bijnor	5	7	1	1	1	2	84.00	17
All Districts	17	33	7	3	1	3	68.28	64

Table 5.16 : Distribution of Units According to Sale Price of Badda Gur.

Districts	Price of Badda Gur (Rs. per Qtls)						Average Price	No. of Units Producing Badda Gur
	Below 100	100-150	151-200	201-250	251-300	300+		
Meerut	-	-	-	-	-	-	-	-
Moradabad	1	3	-	1	1	-	156.00	6
Muzaffarnagar	-	1	3	11	1	-	216.81	16
Saharanpur	-	-	3	9	4	3	252.26	19
Bijnor	1	11	8	1	-	-	147.00	21
All Districts	2	15	14	22	6	3	198.15	62

Chapter VI

MOLASSES AND ITS CONVERSION INTO ALCOHOL

Molasses is produced by the sugar factories as well as the khandsari units. The molasses is mainly put to four uses:

(a) Production of alcohol — The alcohol produced may be industrial alcohol or potable alcohol which is used by the distilleries making country liquor or Indian made foreign liquor;

(b) Production of tobacco;

(c) Production of Oxallic Acid; and,

(d) Given to animals as feed.

In the context of Uttar Pradesh, it may be pointed out that only a negligible proportion of molasses is used as animal feed. Besides this, the state has no unit manufacturing oxallic acid as yet. Thus, we are mainly left with the first two uises of which tobacco production too is not carried out on a very large scale. During the year 1988-89 there were 32 licensed distilleries in the state out of which 18 were making potable alcohol. The number of distilleries in India and some selected states is given in Table 6.1 along with their licensed and installed capacities. The annual licensed capacity in the case of the distilleries of U.P. was 470602 kilo litres.

The production of alcohol between 1979-80 and 1988-89 is givehn in Table 6.2. There has been an overall increasing trend in alcohol production over the years with some fluctuations in between. In U.P. alcohol production more than doubled from 101.25

million litres in 1979-80 to 264.46 million litres by 1988-89. The same was true at the all India level and in the case of Andhra Pradesh. The increase in the case of Tamil Nadu and Maharashtra was of a lower order. In 1988-89 U.P. was contributing around one-third of the total alcohol produced in the country as a whole.

Molasses have sugar as their main constituent. Besides sugar there are some secondary constituents such as calcium, sulphates and iron etc. The proportion of these constituents varies depending on the efficiency of a unit and the type of molasses i.e. whether it is sugar molasses or khandsari molasses.

The major difference between sugar and khandsari molasses lies in their sugar content. Since the modern sugar plants are much more efficient and incorporate a higher levbel of technology, the sugar content in its molasses is of a much lower percentage. Sugar molasses is, therefore, graded on the basis of its sugar content. Thus, the first grade molasses is one where the sugar percentage is in excess of 47 per cent. Similarly, the second grade sugar molasses has a sugar content ranging between 40-47 per cent while any sugar molasses where the sugar content falls below 40 per cent is treated as third grade sugar molasses. Khandsari molasses, on the other hand, has a sugar content above 60 per cent. At times the percentage may be as high as 65 even.

The other main difference between sugar and khandsari molasses lies in its composition of secondary constituents. In sugar factories the sugar cane is mainly treated with lime so it has mainly calcium as its secondary constituent. Khandsari units,

on the other hand, especially the sulphitation units treat the sugar cane mainly with sulphur thus the secondary constituent in the case of khandsari molasses is sulphates. It is generally felt that if potable alcohol is manufactured, khandsari molasses are found to be relatively better since the chances of inflection are lower in it as compared to sugar molasses.

The primary and secondary constituents of molasses directly affect the quantity of alcohol prolduction as well as its quality.

In Uttar Pradesh sugar molasses is directly controlled by the state excise department. It, therefore, fixes the price of sugar molasses. At present the rates fixed for sugar molassexs are as follows:

First grade molasses .. Rs.12 per quintal
Second grade molasses .. Rs. 9 per quintal
Third grade molasses .. Rs. 6 per quintal

Over and above these prices there are certain other costs and duties such as the excise duty, sales tax, handling and transportation charges, etc. which are added to the price of molasses. Thus the first grade sugar molasses finally cost the consumer around Rs.33 per quintal.

The excise department also has a direct control over the distilleries of the state as well. In accordance with the needs of the distilleries, the excise department from time to time directs the distilleries to pick up sugar molasses from specified sugar factories. The quantity to be lifted is also specified. Thus the molasses so lifted by a distillery may be either good

quality or at times even the third grade molasses. This depends on the relative efficiency of the sugar mill from where the molasses was purchased. The higher the efficiency of the sugar factory in terms of sugar manufacture, lower will be its quality of sugar molasses. However, the distillery is under obligation to buy the molasses irrespective of its quality. Khandsari molasses, on the other hand is not an excise item of the state government. The khandsari manufacturers are free to sell their molasses anywhere except to the distilleries of the state. Since they are outside the perview of the excise department there is no fixation of prices and that explains why khandsari molasses is sold at such high prices. The prices of khandsari molasses do keep fluctuating but they rarely go below Rs.90-100 per quintal. On the higher side they may even touch prices as high as Rs.250 per quintal.

When molasses is converted into alcohol by the distilleries the ultimate production of alcohol is determined by the quality of the molasses in terms of its sugar content and the secondary constituents. The secondary constituents are precipitated in the production process. however, a high proportion of these secondary constituents does affect the strength of the alcohol.

The standard measure of alcohol is an Alcoholic Litre (AL). An alcoholic litre means one litre of alcohol whose strength is 100 per cent.

Thus if you convert the first grade sugar molasses which has the prescribed percentage of sugar and also contains secondary

constituents in a normal proportion, then from one metric tonne of molasses 225 litres of alcohol are obtained. Likewise, one metric tonne of second grade molasses gets converted into 200 litres of alcohol. Since the third grade molasses is the worst it gives between 160-180 AL of alcohol.

It has already been indicated that the sugar content of the khandsari molasses is very high. So it gives around 300-320 AL of alcohol.

The production cost of alcohol is the cheapest in the case of Uttar Pradesh and works out to be around Rs.4/- per AL. As against this the production cost in the case of states like Haryana, Punjab, Rajasthan and Maharashtra it is around Rs.7 to 8 per AL. This is primarily so since the distilleries of U.P. are being provided sugar molasses at controlled rates.

However, liquor in the state is sold at much higher prices than in most states because U.P. imposes the highest excise duty as compared to the other states. The difference in the rates of excise duty are so high that they negate the low production cost of alcohol. On the other hand, despite the fact that the other states are manufacturing alcohol at a higher rate the higher costs are off set by the lower rates of excise duty and so they are better off than U.P. as far as the final price of the liquor is concerned. These states can, therefore, afford to purchase khandsari molasses at higher rates without being adversely affected.

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The other states have to go in for purchase of khandsari molasses because their supplies of sugar molasses are not sufficient to cover their demands.

To have a comparative picture of Uttar Pradesh and Haryana the small table below gies a breakup of the different items with respect to the manufacture of a bottle of country liquor:

Table 6.3 : Comparative Picture of U.P. and Haryana with respect to Manufacture of Country Liquor.

(Rs. per bottle)

	Uttar Pradesh	Haryana
Cost of Spirit	2.00	7.00
Bottling charges	5.00	5.00
Excise Duty	17.00	11.00
Sales Tax	5.00	5.00
	29.00	28.00

Thus it is evident from the above table that Haryana distilleries are able to produce country liquor cheaper despite the fact that the cost of spirit is much higher than in U.P. But it is more than offset by the lower excise rates.

In the case of U.P. one Alcoholic litre produces roughly 2.25 bottles of liquor since the distilleries of U.P. have to keep the alcohol strength around 42 per cent.

We had discussions with a few distilleries of U.P. making potable alcohol. They expressed the view that they would be

unwilling to purchase khandsari molasses even if the excise department lifted its ban, for the simple reason that it would be uneconomical to them a the existing rates of khandsari molasses.

Our survey of the five districts has clearly indicated that not all the khandsari molasses is being sold outside U.P. even though the percentage of sale outside U.P. is quite high. The units of Meerut have reported that most of the khandsari molasses is being sold within U.P. Keeping in mind the fact that only a negligible amount of molasses is being used for animal feed and that the state has no oxallic acid manufacturing unit, the only other uses to which the molasses could be put to is making tobacco, industrial alcohol and potable alcohol. It was during the field survey that we had got indications that the distilleries producing potable alcohol do purchase khandsari molasses as well. They find out if the khandsari unit is willing to sell and also the price. Then they send their chemist who checks the sugar strength and the deal is finalised.

In the case of the states outside U.P. it was indicated that while part of the high cost is made up by the low rates of excise duty the distilleries utilize whatever sugar molasses they get, or at least most of it, for manufacturing country liquor whose rates are lower and keep aside the higher priced khandsari molasses to produce Indian made foreign liquor. As this type of liquor sells much higher a relatively higher cost per AL of alcohol too become profitable when whisky or more superior brands of liquor are manufactured from the khandsari molasses. The same could, therefore, hold true even in the case of the distilleries of U.P.

Over and above the purchase of sugar molasses, these distilleries may well be meeting their additional requirements for the manufacture of Indian made foreign liquor through the purchase of khandsari molasses. In order to try and verify this hypothetical situation we took the total quantity of sugar molasses produced in the state during the year 1988-89. We further assumed that the entire sugar molasses was converted into alcohol, that nothing was utilized for tobacco manufacture or animal feed. It was also presumed that the total quantum of sugar molasses (108.31 lakh quintals) was all first grade (an assumption which is highly unrealistic). We know that one metric tonne of first grade sugar molasses gives 225 AL of alcohol. Thus during the year 1988-89 243.675 million litres of alcohol could have been produced. However, the alcohol production as stated in Table 6.2 was 264.46 million litres. This is in excess of what could have been produced by the given quantum of sugar molasses. The short fall is of the order of 207.85 lakh litres. This would be much more for the simple reason that sugar molasses produced was of all three grades. One can, therefore, draw one's own conclusion as to whether khandsari molasses are being utilised by the state distilleries or not.

Table 6.1 : Statewise Selected Number of Distilleries in 1988-89
(Upto March 1989) — Their Annual Licenced &
installed Capacity.

States	No. of Distill- eries	Annual Licenced Capacity (Kilo Litres)	Annual Installed Capacity (Kilo Litres)
Andhra Pradesh	21	103149	106174
Maharashtra	43	390998	373863
Tamil Nadu	9	96480	101120
Uttar Pradesh	32	455465	470602
All India	200	1555505	1586928

Source : National Federation of Cooperative Sugar Factories Ltd.,
New Delhi, Vol.21, May, 1990.

Table 6.2 : Statement showing Production of Alcohol During the years
1979-80 to 1988-89.

(Million Litres)

State	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
Andhra Pradesh	33.89	45.22	56.00	58.33	52.12	38.62	46.97	55.16	60.00	69.89
Maharashtra	122.43	119.35	121.58	135.83	146.52	165.52	154.76	151.75	152.27	189.49
Tamil Nadu	42.70	37.88	46.74	59.95	57.16	57.80	76.84	63.21	64.80	71.11
Uttar Pradesh	101.25	125.00	158.50	160.69	179.54	159.20	146.30	174.25	174.64	264.46
All India	385.61	430.85	515.38	535.58	575.92	590.32	580.10	616.24	636.18	797.32

Source : National Federation of Cooperative Sugar Factories Ltd., New Delhi, Vol.21,
May 1990.

Chapter VII

PROBLEMS OF THE KHANDSARI UNITS

In order to have an idea regarding the various problems which a khandsari unit is faced with, we kept a section of the questionnaire specifically for this purpose. We also kept another set of questions to have the views of the entrepreneurs themselves in order to find out how they feel that these problems can best be overcome. This chapter, therefore, throws light on the different problems which the entrepreneurs face in running their units and on their suggestions for the removal of the same.

The basic problems are those which arise out of:

(a)   Availability, prices and quality of sugarcane;

(b)   Problems related to labour;

(c)   Problems related to power; and,

(d)   Other problems.

With respect to sugarcane the general impression which the units gave was that they face a stiff competition in the procurement of sugarcane. They pointed out that the large scale sugar factories are fully secure in this respect since each factory has a reserved sugarcane area for itself, covering a radious of 16 kms. The other category of units which compete with the khandsari units are the power crushers or `khara kolhu` who, despite the ban, are openly purchasing sugarcane from the cultivators. Over the last few years the number of khara kolhu units have increased phenomenally. Thus the khandsari units are

placed in a disadvantageous position since they have also to pay a purchase tax of Rs.1.50 per quintal on the sugarcane they buy. Thus the khara kolhu units can afford to raise the price of the cane by upto Rs.1.50 per quintal in order to lure away the cultivators. This problem is felt much more if supplies are inadequate during the peak crushing period. Since the khara kolhu owners can afford to raise the price by upto Rs.1.50 per quintal, the entrepreneurs also complain of higher prices of sugarcane. Yet another complaint regarding sugarcane is that the the quality of sugarcane is not very good and this, therefore, adversely affects the recovery rates. In fact, among all the districts this has been the major concern except in the case of Meerut. While the problems were highlighted by the different units there were also many units which had no problem at all with respect to sugarcane. The share of such units was the highest in the case of Bijnor (32.7%) (Table 7.1).

Labour, as already indicated earlier, is a problem for the khandsari units. The most serious problem is that local labour is not easily available. This problem is particularly acute in the districts of Meerut, Muzaffarnagar and Saharanpur. While Meerut has a developed agricultural and industrial sectors in the state the labour shortages are understandable. While Muzaffarnagar may not be very advanced industrially, it is probably the most advanced district from the point of view of agriculture. Saharanpur, like Meerut has a fair industrial as well as agricultural base. Thus while there is a general problem with respect to availability of labour, it is also the case with

respect to availability of skilled labour. The other problems
cited with respect to labour are high wages and the problem of
handling labour particularly the local labour. When they talked
of high wages they also had in mind the other benefits which have
to be paid such as train fares to the non-local labour to ensure
that he stays with them during the next season, the commission
paid to the labour contractor who provides non-local labour on
time etc. (Table 7.2). The non-local labour make their hutments
within the premises of the khandsari unit and stay there through-
out the crushing season. This is an advantage in the sense that
it avoids absenteeism but they have to be provided with extra
benefits from time to time. Moreover, the government has recently
introduced a Provident Fund Scheme for the casual labour as well.
All these factors inflate the wage bill.

Power is a major problem all over the state and so the
khandsari units are also affected by the shortages of supply. The
units have to keep standby arrangements to ensure that the
production process is unhampered. For this they are having their
own generating sets. In fact in the entire sample there was no
unit, not been the smallest one, which did not have its own
generating set. On the contrary almost one-fifth of the units
had not taken electric power for crushing. In Saharanpur 60 per
cent of the units were using only their personal generating sets
to meet their power requirements. It was indicated that the power
supply was very irregular by over 64 per cent units from the five
districts taken together. Similarly around 35 per cent units
indicated that the power supply was inadequate to meet their
actual demands (Table 7.3).

While these three were the most important problems, there were various other problems as well which the units are faced with. Nearly one-fourth of the units complained of low recovery while around one-fifth felt that they were not getting proper co-operation by the government officials. The khandsari units are either directly or indirectly under the control of a number of government departments. Some of these are the Cane Commissioner's Office; The Labour Office; Weights and Measures Department; Office of the District Magistrate; Sales Tax Department; Mandi Parishad. These are only a few. The list actually is much longer. Undue interference by these departments is a cause of concern to the units. The other problems cited are non-availability of easy finance, competition from the khara kolhu owners, the increase in purchase tax and the existing Mandi Tax structure, etc. In fact, all the units except only two from the entire sample, voiced their concern over one thing or the other (Table 7.4).

Keeping in mind these problems, the entrepreneurs also came out with a number of suggestions through which they feel that their existing problems may be overcome. In the first instance they talked of modernisation of the existing khandsari units. One of the easiest ways for this, as suggested by the entrepreneurs themselves, is to grant them the permission to install mini-boilers. They argue that in the open-pan system nearly 1.5 per cent of recovery loss is caused by the fact that the cane juice is boiled in open-pans and so there is loss due to evaporation. Besides this, bagasse is the major fuel in the open-pans. In order to ensure that bagasse gives off sufficient heat they do not

extract the entire juice and this entails a loss of nearly one per cent. On the whole, therefore, recovery is affected by around 2 to 2.5 per cent. They, therefore, claim that in case the permission to install a mini-boiler is granted the recovery rates will immediately jump from the existing 6 per cent or so to around 8 to 8.5 per cent which is barely one percentage point below the average recovery rate of the large sugar mills of the state.

The other area where they feel a change is required is the rates of taxes. They feel that the purchase tax and also the mandi tax be lowered. If the mandi tax is lowered they might sell much more within the state and so the ultimate earnings of the government through the mandi tax may be much higher than what they are at present.

In view of the bureaucratic structure and the existing pattern within which a number of government departments exercise control over the khandsari units, the entrepreneurs feel that it would be much better if they could be brought under the overall control of a single at the most two or three departments. This would make things much easier not only for the units but for even the state government. The units and the government would end up as beneficiaries in terms of time and money spent.

At present a rule exists within which the khandsari units have to sell 30 per cent of their production within the same month it was actually produced. This they feel is to their disadvantage because during a given month the prices may be quite low. In such a case a mandatory sale may be an unprofitable proposition.

The government should do something in order to supply timely and adequate power. They are heavily dependent on generating sets which run on diesel. The prices of diesel have been on the rise and so their overall cost of production gets affected. Had power been available it was a cheaper alternative.

Nearly 10 per cent of the units felt that Provident Fund deduction for the casual labourers should be done away with. Not only is it a financial burden but even managing the accounts is a very tedious process. Things would be even more complicated when after working for say a year or two a worker does not return to work.

The other suggestions were that the government must do something to ensure that the khara kolhu owner are not allowed to purchase sugarcane from the open market. Although the rules clearly say that they are to crush only that much cane as is grown by them, they have been disobeying the law since there is no control over them. Yet another area where they feel the government can come forward to their assistance is in making cheap finance easily available to meet their requirements (Table 7.5).

We, therefore, observed that problems in running a khandsari unit have been mainly arising out of factors such as availability and quality of sugarcane, labour and power supply. The entrepreneurs have given various suggestions in order to overcome these bottlenecks.

Table 7.1 : Problems Regarding Availability, Prices and Quality
of sugarcane.

Districts	Total Units	Type of Problems					Total Responses
		Inadequate supply	Irregular supply during peak season	High prices of sugarcane	Poor quality of sugar- cane	Units without any pr- oblem	
Meerut	17	10 (25.64)	12 (30.77)	10 (25.64)	6 (15.39)	1 (2.56)	39 (100.00)
Moradabad	32	13 (22.41)	11 (18.97)	15 (25.85)	12 (20.69)	7 (12.07)	58 (100.00)
Muzaffar- nagar	20	8 (22.86)	5 (14.29)	9 (25.71)	11 (31.43)	2 (5.71)	35 (100.00)
Saharanpur	20	5 (14.71)	4 (11.76)	12 (35.30)	9 (26.47)	4 (11.76)	34 (100.00)
Bijnor	37	5 (9.62)	10 (19.23)	5 (9.62)	15 (28.84)	17 (32.69)	52 (100.00)
Total	126	41 (18.81)	42 (19.27)	51 (23.39)	53 (24.31)	31 (14.22)	218 (100.00)

Note : Figures in brackets are percentage to total responses.

Table 7.2 : Problems related to Labour.

Districts	Total Units	Type of problems					Total Responses
		Not enough local labour	Problem of ski-lled labour	High Wages	Problem of hand-ling labour	Unit without any problem	
Meerut	17	16 (57.15)	2 (7.14)	8 (28.57)	1 (3.57)	1 (3.57)	28 (100.00)
Moradabad	32	18 (34.62)	10 (19.23)	17 (32.69)	-	7 (13.46)	52 (100.00)
Muzaffarnagar	20	16 (53.33)	4 (13.33)	7 (23.34)	-	3 (10.00)	30 (100.00)
Saharanpur	20	17 (51.52)	3 (9.09)	10 (30.30)	1 (3.03)	2 (6.06)	33 (100.00)
Bijnor	37	20 (35.71)	8 (14.29)	10 (17.86)	7 (12.50)	11 (19.64)	56 (100.00)
Total	126	8 (43.72)	27 (13.57)	52 (26.13)	9 (4.52)	24 (12.06)	199 (100.00)

Table 7.3 : Problems related to Power Supply.

Districts	Total Units	No.of Units not using elect- ricity	Type of Problem			Total Responses
			Irregular supply	Supply inadequate	Units without problem	
Meerut	17	3	13 (59.09)	8 (36.36)	1 (4.55)	22 (100.00)
Moradabad	32	1	26 (59.09)	18 (40.91)	–	44 (100.00)
Muzaffarnagar	20	4	15 (75.00)	5 (25.00)	–	20 (100.00)
Saharanpur	20	12	9 (75.00)	3 (25.00)	–	12 (100.00)
Bijnor	37	3	29 (64.44)	16 (35.56)	–	45 (100.00)
Total	126	23	92 (64.34)	50 (34.96)	1 (0.70)	143 (100.00)

Note : Figures in brackets are percentage to total responses.

Table 7.4 : Other Problems.

Districts	Total Units	Type of problem				
		Low Recovery	Non-co-operation by Govt. Officials	Problem of fin-ance	Competi-tion from khara kolhu	High Rates of Taxes
Meerut	17	13 (38.24)	4 (11.76)	–	–	4 (11.76)
Moradabad	32	14 (22.58)	17 (27.42)	3 (4.84)	–	17 (27.42)
Muzaffarnagar	20	6 (14.63)	10 (24.39)	5 (12.20)	4 (9.75)	5 (12.20)
Saharanpur	20	8 (19.51)	7 (17.07)	1 (2.44)	5 (12.20)	5 (12.20)
Bijnor	37	24 (33.80)	14 (19.72)	5 (7.04)	1 (1.41)	10 (14.08)
Total	126	65 (26.10)	52 (20.88)	14 (5.62)	10 (4.02)	41 (16.47)

Table 7.4 (contd.....)

Districts	Type of problems			
	High Prices of Sugarcane & other inputs	Scheme of compulsory P.F. dedu-ction	Unit without problem	Total Responses
Meerut	–	13 (38.24)	–	34 (100.00)
Moradabad	8 (12.90)	3 (4.84)	–	62 (100.00)
Muzaffarnagar	5 (12.20)	6 (14.63)	–	41 (100.00)
Saharanpur	9 (21.94)	5 (12.20)	1 (2.44)	41 (100.00)
Bijnor	13 (18.31)	3 (4.23)	1 (1.41)	71 (100.00)
Total	35 (14.06)	30 (12.05)	2 (0.80)	249 (100.00)

Note : Figures in brackets are percentage to total responses.

Table 7.5 : Suggestions of the Entrepreneurs to Improve the Khandsari Industry.

Districts	Total Units	Type of Suggestions				
		Mini Boiler to be allowed	P.F. Deduction to be abolished	Lower Rates of Taxes	Govt. control on khara kolhu	Easy finance
Meerut	17	11 (15.27)	12 (16.67)	13 (18.06)	–	6 (8.33)
Moradabad	32	15 (23.44)	3 (4.69)	15 (23.44)	2 (3.13)	3 (4.69)
Muzaffarnagar	20	3 (6.12)	6 (12.24)	8 (16.33)	8 (16.33)	6 (12.24)
Saharanpur	20	6 (17.14)	5 (14.28)	5 (14.28)	3 (8.57)	2 (5.73)
Bijnor	37	23 (30.67)	3 (4.00)	15 (20.00)	–	7 (9.33)
Total	126	58 (19.66)	29 (9.83)	56 (18.99)	13 (4.41)	24 (8.14)

Table 7.5 (contd....)

Districts	Type of suggestions					
	No restriction on sale of khandsari	Modernisation of units	Improve power supply	One window facility	No Response	Total Response
Meerut	7 (9.72)	10 (13.89)	10 (13.89)	3 (4.17)	–	72 (100.00)
Moradabad	1 (1.56)	4 (6.25)	10 (15.62)	11 (17.18)	–	64 (100.00)
Muzaffarnagar	–	6 (12.24)	4 (8.17)	8 (16.33)	–	49 (100.00)
Saharanpur	–	1 (2.86)	1 (2.86)	5 (14.28)	7 (20.00)	35 (100.00)
Bijnor	1 (1.33)	6 (8.00)	10 (13.33)	8 (10.67)	2 (2.67)	75 (100.00)
Total	9 (3.05)	27 (9.15)	35 (11.86)	35 (11.86)	9 (3.05)	295 (100.00)

Note : Figures in brackets are percentage to total responses.

Chapter VIII

CONCLUSION AND POLICY RECOMMENDATIONS

In the preceding chapters we have tried to analyse the various aspects of the khandsari industry of Uttar Pradesh on the basis of secondary data as well as primary data of the 126 units surveyed by us from the five selected districts. We shall now give an overview of the study and then indicate some suggestions which may be of help for the policy makers.

The khandsari industry is a very old and traditional one. To begin with a very primitive technology was adopted for producing khandsari. However, the process was modified and the open-pan sulphitation system was introduced through which better quality khandsari was produced with a relatively higher productive efficiency. But even today not all the khandsari units are sulphitation units and even the sulphitation units can not match the large sugar mills either in the whiteness of the sugar nor sugar recovery.

In Uttar Pradesh the khandsari sector is very heavily concentrated in the Western Region which is the dominant sugarcane growing area of the state. There was a time when the total number of khandsari units in the state was very large (3500 in 1975-76), but over the years the number of khandsari units have been going down quite fast (1552 in 1989-90). In fact, during the present crushing season their number is only 1110 as far as the working units are concerned.

However, although there has been a declining trend in the total number of units, the total sugarcane crushed and consequently the production of khandsari has shown a considerable increase. In 1975-76 there were 3500 working units which crushed around 550 lakh quintals of sugarcane and produced around 23 lakh quintals of khandsari. Despite the fact that the total khandsari units had come down to 1550 in 1989-90, the sugarcane crushed was of the order of 1120 lakh quintals and khandsari production stood at 51 lakh quintals. It, therefore, seems that the units to have closed down were the small and less efficient ones and those which continue to be in production are the ones whose efficiency is much higher. Despite the overall increases even total sugarcane crushed and khandsari produced has been declining since the last four years or so. In 1986-87 the total quantum of sugarcane crushed had been 1283 lakh quintals and khandsari produced was 66 lakh quintals. Thus it seems that there are certainly some problems which the units are facing because of which we are having this declining trend. These facts were also confirmed from our field survey. By and large, over the past two years a lesser quantity of sugarcane has been crushed in our sample units leading to a shortfall in khandsari production as compared to two years ago.

This study of the khandsari units of Uttar Pradesh is based on secondary as well as primary data. Secondary information was collected from the Cane Commissioner's Office, Lucknow and its respective offices in each of the five districts selected for the study. Since this information was related only to total units,

sugarcane crushed and production of different products, we supplemented the data by the information provided by the Economics and Statistics Division of the State Planning Institute in their publication Annual Survey of Industries.

The primary information is based on a survey of 126 khandsari units located in the Western Region of Uttar Pradesh. These districts together had accounted for 81 per cent of the total output and 76 per cent of total employment in the entire khandsari sector of the state (ASI data for 1985-86).

The study brings out the fact that the khandsari units are generally old units. The government policy has not been one of encouragement and so new licenses are not normally issued except under special circumstances. Meerut, however, had a high percentage of new units.

The khandsari units of these districts are mainly using two sizes of crushers — the 11" x 14" and the 13" x 18" crushers. between them the former is the dominant one since nearly 70 per cent units have this crusher size. There were more sulphitation units than non-sulphitation units. While Meerut had only sulphitation units, the units of Saharanpur were all non-sulphitation units. The overall average quantity of sugarcane crushed per unit worked out to be 1.12 lakh quintals. Around 45 per cent units were crushing less than 1 lakh quintal of sugarcane per season. The recovery rates of khandsari and molasses was 5.33 and 4.37 per cent respectively for all the five districts taken together. Meerut had the highest recovery rate of khandsari while

the recovery rate for molasses was the highest in case of Muzaffarnagar. A higher recovery of khandsari would naturally mean a lower molasses recovery.

The entrepreneurs, who generally belonged to rural areas, had an average age of 43 years. What was very encouraging was the fact the entrepreneurs were well educated. Nearly 51 per cent were graduates and post-graduates and another 11 per cent had technical qualifications. Only around 44.5 per cent of the entreprenerus had land holdings and out of this only half was under sugarcane.

Since a khandsari units requires a fairly big land area to store sugarcane and to dry the bagasse a reasonable investment has been made of land and building keeping in mind the fact that they are rural units and fairly old. The value of plant and machinery was not very high since we were provided depriciated values. But a new sulphitation plant based on 1989-90 prices is estimated to have cost around Rs.14 lakhs. Among the districts Meerut had the highest value for fixed capital, working capital as well as productive capital per unit.

Since the industry is a seasonal one, it offers little scope for regular employment. Each unit employes only a minimum number of persons on a regular basis depending on their individual requirements. On an average the regular employment was 4 persons and their salaries depended on their nature of work. The salaries therefore, ranged from around Rs.500 to Rs.1500 per month.

Being a seasonal industry, they depend heavily on casual

labour throughout the crushing season. Although this labour is both local and non-local, the share of the latter is much higher. Non-local labour comes mainly from Eastern U.P. and Bihar and is supplied by labour contractors. The average daily wages were around Rs.25 per worker for a 10 hour work schedule.

Capital efficiency, seen in terms of per worker value of plant and machinery as well as fixed and productive capital, go to indicate that the industry is a traditional one because these figures are rather low. The industry, therefore, can be classified as a labour intensive type. The plants are fairly old and in the existing circumstances there is not much scope for modernisation.

Looking at the expenditure pattern of the khandsari units it was foundd that sugarcane is the most important input accounting for around 70 per cent of the total expenditure. Taking the other raw material inputs with sugarcane, nearly three-fourths of the expenditure is on raw material inputs.

Fuel inputs taken together constitute around 6 per cent of the total expenditure. The most important of these is diesel which is required for operating the generating sets since electricity supply is both irregular as well as inadequate.

Wages and salaries constitutes around 9 per cent of the total expenses. The other items of expenditure are miscellaneous and other expenses, depriciation and taxdes. Their share in total expenses is relatively much low.

The main products of a khandsari unit are khandsari, pure gur, molasses and 'badda gur'. besides this some quantities of raab are also sold in some districts. Since Meerut has the most efficient and relatively larger sized units the value of output per unit was the highest among all the five districts. Since Saharanpur had smaller units and that too only non-sulphitation units its value of output per unit was the lowest. Meerut, therefore, had the highest production of khandsari as well as molasses per unit. It, however, does not produce 'badda gur' whose output per unit was the highest in the case of Muzaffarnagar.

Looking at the cost of production of khandsari per quintal Moradabad and Meerut had the lowest average cost. The cost of production was the highest in the case of Muzaffarnagar. But even in the case of Meerut and Moradabad this cost of production was more than the average selling price of khandsari. This led to the obvious conclusion that the khandsari units have their profits outside khandsari and that is why they are still in production. Their profits actually lie in their sales of molasses and 'badda gur'. Although Meerut is the most efficient district its value added and value of output per worker was not the highest possibly because its employment levels are much higher. Similarly its value of output per unit of fixed and productive capital too were lower as compared to the other districts. This may be explained in terms of the fact that Meerut has relatively new units and so the initial returns on investment are of a lower order. However, what is encouraging is the fact that as compared to the value

added per worker figures of the Annual Survey of Industries for 1985-86, the figures of value added per worker estimated by us for 1989-90 have gone up quite considerably for all the districts.

Khandsari products are sold within the state as well as in other states such as Haryana, Punjanb, Gujarat, Maharashtra, West Bengal, Rajasthan and Jammu and Kashmir. A very high proportion of pure gur (92%), raab (69%) and badda gur (93%) is being sold fully outside the state. In the case of molasses, however, around 61 per cent is being sold within the state. Khandesari on the other hand was the product where we found 71 per cent units making their sale deal both within and outside U.P.

Most of the sale is being carried out with the help of commission agents while the rest is handled through wholesale dealers.

There were marked variations in the selling price of different products not only among the different districts but also among units within the district. These variations were quite striking particularly with respect to the sale price of molasses and `badda gur. It, therefore, seems that the reporting prices of these two products hardly present a realistic picture since our discussions in the course of the field survey revealed that although the prices of badda gur and molasses keep fluctuating in accordance to the day to day demand and supply conditions, but they rarely go below Rs.100 per quintal.

The problems faced by the khandsari units primarily arise out of the supply conditions or the quality of sugarcane, labour and

present power situation. It is claimed that there are times when sugarcane availability poses a problem or that the quality of sugarcane is such that the recovery rates are adversely affected. Local labour is a problem both from the point of view of its availability as well as management. The non-local labour, which comes mainly from Eastern U.P. and Bihar, have to be paid rail fares to and fro to ensure that they come back on time in the crushing season. Power is another hinderance in the smooth functioning of the units as the supply is irregular and inadequate. The entrepreneurs hae to keep generating sets as stand by arrangements and since diesel costs have been going up, their cost structure goes up. Besides this the other problems indicated were lack of co-operation from government departments as well as interference of numerous government departments.

In view of these problems the entrepreneurs gave some suggestions as well which could help in overcoming the same. The low recovery rates could be off set according to them if only the goernment grants them permission to install mini-boiler plants. Through this the recovery rates could be brought upto 8 - 8.5 per cent. They also suggest rationalisation of the tax structure - both procurement tax and mandi tax, and the restructuring of the present system where they are directly or indirectly responsible to numerous government departments. They feel it would be much better if they could be brought under the overall control of a single department. Besides this they would like assured and adequate supply of power and facilities of easy finance. Finally they feel that there must be some control over the 'khara kolhu'

owners whose numbers have risen phenomenally over the last few years and who are a big competitor of the khandsari units in the purchase of sugarcane.

Besides the survey of the khandsari units we also sureyed a few distilleries to gather some information regarding molasses and its conversion into alcohol. Molasses is mainly used for producing alcohol, tobacco, oxallic acid and animal feed. In the distilleries the left over of molasses after conversion to alcohol is utilized for manufacture of fertilizers. In Uttar Pradesh molasses is used mainly for producing alcohol and tobacco. There is no oxallic acid plant and hardly any molasses is used as animal feed. The state in 1988-89 had 32 distilleries of which 18 were manufacturing potable alcohol.

The major difference in sugar and khandsari lies in its sugar content and in the composition of its secondary constituents. While sugar content in sugar molasses rarely exceeds 50 per cent, it rarely falls below 60 per cent in the case of khandsari molasses. As far as the secondary constituents are concerned, sugar molasses contain calcium while khandsari molasses contain sulphates. The sugar content directly affects the alcohol recovery. Thus from one tonne of best grade sugar molasses 225 litres of alcohol (100% pure) are obtained whereas the same quantity of khandsari molasses yields between 300 - 320 litres of alcohol (100% strength).

The state excise department controls sugar molasses by way of its prices and its sale to the distilleries of the state. It

however, does not exercise any control over khandsari molasses. But the khandsari molasses, although free to sell their molasses, can not do so to the distilleries.

The average production cost of alcohol - around Rs.4 per litre is the lowest in U.P. as compared to any other state. But liquor prices in the state are higher since the excise duty on it is the highest in U.P. as compared to other states.

Conclusion and Suggestions

On the basis of the above findings it is worthwhile drawing some conclusions and thereby offer suggestions which may be of some use in any policy formulation for the khandsari industry.

In the first instance, if we go by the estimates of sugarcane produced in the state and the corresponding figures of sugarcane crushed in the sugar mills and the khandsari units, a big quantum is still left over even if we account for the 17 per cent of sugarcane which has to be set aside for seed and other purposes. Since sugarcane cultivation has been on the increase during the past few years it is quite unlikely that such large quantities of sugarcane were left unsold. There is, therefore, reason to believe that both the sugar mills and khandsari units are not providing accurate information regarding total sugarcane crushed. Our field survey team after some probing detected under-reporting of sugarcane crushed in the sugar mills as well as the khandsari units. A partiular sugar mill for instance is crushing around 3 tonnes of sugarcane in excess of its licensed capacity and it was

indicated that the excess crushing may even exceed 3 tonnes. Similarly in the case of khandsari units there were cases of units which had taken the license stating that they will be using 6 rollers whereas they were using 9 rollers. Discussions at the Cane Commissioner's Office revealed the fact that each khandsari inspector has 10 units under him and so they can not visit each unit regularly to ensure that they are providing accurate information regarding either the cane crushed or the resultant production of the various products.

The other aspect which draws attention is the high cost of production of khandsari. The cost of production is higher than the average selling price. This then leads to the obvious conclusion that the economics of a khandsari unit lies not in the khandsari production but in the production of molasses and badda gur.

Obvious doubts also arise regarding the selling prices of molasses and badda gur. Both these products are mainly used for the production of alcohol and besides U.P. they are sold in various other states among which Gujarat is an important one. Since Gujarat is a dry state khandsari molasses and badda gur fetch a very fancy price as against the prices which are indicated by most units. Badda Gur is despatched in bagss bearing 'animal feed' so as to avoid any complication. Prices may be as high as Rs.250 per quintal but not below Rs.100 in any case. Besides the understating of prices, some costs especially those indicated against miscellaneous expenses seem inflated so as to make necessary adjustments in the balance sheets.

The Cane Commissioner's Office therefore needs to excercise greater control such that the data they bring out can be more realistic. This is particularly true not only for total sugarcane crushed but also for molasses and badda gur produced. In fact, the information provided by the office has no mention at all of badda gur. Even the production figures of molasses are gross underestimates. For example the 17 units of Meerut surveyed by us report a total production of 1.26 lakh quintals whereas no data is available for molasses production in the records of the Cane Commissioner's Office (1989-90).

The state government during the recent past, has been neglecting the sector. New licenses are not easily issued and even the existing units do not easily get permission to expand their existing capacities. The rationale behind it may be that the sector is less efficient as compared to the sugar industry in terms of recovery rates. But if the government could agree to their request of setting up mini-boiler plants the recovery rates can be stepped up appreciably. It may, therefore, allow these units to set up mini-boiler plants annd accordingly make necessary alterations in its policy. First of all the license fee for units with mini-boiler plants may be stepped up. Secondly, the 30 per cent khandsari which a unit has to sell within the same month when it was produced may be taken by the government itself as levi at fixed prices as is done in the case of sugar mills.

The government has been providing financial assistance to small scale industries. Although the khandsari units come under small scale industries these financial benefits are not given to

them.   If this is provided they could suitably modernise their plants and attain better recovery or even tide over their day to day financial problems.

Improvements in the power sector are essential for the overall development of the state. Once this goal is achieved even the khandsari sector will be the beneficiary and their cost structure will come down since power will be available to them and they can stop spending money on diesel as is presently the case.

The khandsari units certainly have a point with respect to the various government departments which excercise direct or indirect control over them. At present there are 34 different departments which have some control over this sector.   This procedure can certainly be rationalised and the number reduced.

Besides this, it may have been a good policy to allow the cultivator to install a `khara kolhu' to crush the sugar cane produced by him and convert it to gur. But in actual practice the khara kolhu owners are purchasing sugarcane from the open market and even producing khandsari. The government must, therefore, think of suitable ways and means to stop this malpractice.

If these measures to improve the condition of the khandsari sector are taken it will not only prove beneficial to the entrepreneurs but will also affect the revenues of the government provided better control is exercised on the sector.

In case the government is thinking of bringing khandsari molasses under the perview of the state excise department then it

must be very clear that this will hit the sector very hard as they are mainly doing well on the basis of the sale of molasses and badda gur. The prices at present are quite lucrative and they more than offset the high production cost of khandsari. The moment its prices are controlled by the excise department their cost — benefit ratio will immediately be adversely affected and one may find the number of khandsari units going down at an even faster rate than at present.

Finally, if the attitude of the government is one to allow the khandsari units to die out in the near future since they are inefficient then it must take into account three important factors whose importance can not be undermined.

(a) Should these units die out, how will the khandsari and gur production be affected. These products are most commonly used in the rural areas as they are cheaper substitutes of mill made sugar. So on the one hand you have the problem of the poor man's pocket and on the other hand you have to keep in mind the demand and supply situation. Can this shortfall be made good by the sugar mills?

(b) The other important aspect is that of the sugarcane cultivators. Sugarcane is a major cash crop especially in the Western region. In case the khandsari sector ceases to exist or even if it keeps declining at the present rate then ultimately it will affect the sugarcane production untill and unless the government so plans to set up more and more sugar mills to take care of the sugarcane production.

(c) Even if the above mentioned facts are taken care of, what is probably of even more importance is the fact that since the sector is labour intensive it offers employment opportunities to a large number of workers. As it is the unemployment situation is quite grim and one would not like to see it getting any worse.

These are, therefore, some areas which will need attention in deciding the ultimate fate of the khandsari sector.